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Final Environmental Impact Statement for the Ball Hill Wind Project Chautauqua County, New York Volume 1

November 2016

Prepared for:

Ball Hill Wind Energy, LLC
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Broomfield, CO 80021

Prepared by:

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Global Environmental Specialists

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List of Abbreviations and Acronyms

2008 DEIS	Draft Environmental Impact Statement (accepted in 2008)
AM	amplitude modulation
APE	area of potential effect
AWWI	American Wind Wildlife Institute
Ball Hill	Ball Hill Wind Energy, LLC
BBCS	Bird and Bat Conservation Strategy
BMP	best management practice
CRIS	Cultural Resources Inventory System
dBA	decibels (A-weighted)
DHS	U.S. Department of Homeland Security
E & E	Ecology and Environment, Inc.
Eagle MP	Eagle Management Plan
ECL	(New York State) Environmental Conservation Law
EMP	Environmental Monitoring Plan
ERP	Emergency Response Plan
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FM	frequency modulation
FTE	full-time equivalent
GIS	geographic information system
GSU	generation step-up
Hz	Hertz
km	kilometer
kV	kilovolt
LMR	land mobile radio
LOD	limit of disturbance
MassDEP	Massachusetts Department of Environmental Protection

List of Abbreviations and Acronyms (cont.)

MDPH	Massachusetts Department of Public Health
MDS	map-documented structure
MSDS	material safety data sheet
MW	megawatt
NHPA	National Historic Preservation Act
NLEB	northern long-eared bat
NRE	National Register Eligible
NRHP	National Register of Historic Places
NRL	National Register List
NYCRR	New York Codes, Rules, and Regulations
NYSDAM	New York State Department of Agriculture and Markets
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
O&M	operation and maintenance
Panamerican	Panamerican Consultants, Inc.
Project	Ball Hill Wind Project
NYSPSC	New York State Public Service Commission
RES	Renewable Energy Systems Americas, Inc.
ROW	right-of-way
SDEIS	Supplemental Draft Environmental Impact Statement
SEQRA	(New York) State Environmental Quality Review Act
SHPO	State Historic Preservation Office
SWPPP	Storm Water Pollution Prevention Plan
Town Laws	Wind Energy Facilities Law of the Town of Villenova and Article XIV of Town of Hanover Zoning Laws: Wind Energy Conversion Systems
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
Villenova Town Law	Wind Energy Facilities Law of the Town of Villenova
VRA	visual resource assessment
W	watts
WECS	wind energy conversion system
V126	Vestas Model 126-3.45MW IEC IIA/IIB turbines

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Definitions

The following terms are used throughout this document to describe the proposed action.

- **Project.** "Project" refers to all activities involved in the construction, operation and decommissioning of the Ball Hill Wind Project described herein and all components thereof, including, but not limited to, wind turbines (including blades, nacelles, towers, pads, and foundations); electrical transmission and collection lines and poles; trenches; access roads; laydown areas, Operations and Maintenance (O&M) buildings and related structures.

- **Project Area.** The Project Area (see Figure 1) is denoted by the outer boundary of the geographic area that contains all wind energy facilities (as defined in the Villenova and Hanover wind laws) including, without limitation, turbine sites, access roads, transmission line and collection system components, O&M building, laydown areas, collection substation, and interconnection substation.

- **Wind Overlay (Zoning) District.** A Wind Overlay (Zoning) District is defined by the Town of Villenova Local Law 1 of 2007 and the Town of Hanover Local Law 1 of 2008 as a zoning district that encompasses part or parts of one or more underlying districts and that establishes requirements for wind energy facilities. Both laws require that all wind energy conversion systems must be within a Wind Overlay District. For this Project, the term "Wind Overlay District" is synonymous with "Project Area," and Ball Hill seeks the creation of such a district.

- **Project Site.** The Project Site consists of land within the Project Area that has the potential to be permanently or temporarily disturbed as a result of the construction, operation, or decommissioning of Project facilities (including wind turbines, electrical collection and transmission lines, utility trenches, utility poles, access roads, staging areas, mitigation areas and other related structures). Ball Hill has obtained property interests or is in the process of finalizing negotiations for all parcels that would host Project components or for which a setback waiver within the Project Site is required.

- **Project Sponsor.** The Project Sponsor is the Ball Hill Wind Energy, LLC. Throughout this document the Project Sponsor will be referred to as "Ball Hill."

1 Project Description

1.1 Introduction

Ball Hill Wind Energy, LLC (Ball Hill), a company owned by Renewable Energy Systems Americas, Inc. (RES), proposes to construct and operate the Ball Hill Wind Project (Project) in the towns of Villenova and Hanover, Chautauqua County, located in western New York State. Construction of the Project would be expected to begin in 2017 and be complete in 2018.

This Final Environmental Impact Statement (FEIS) has been prepared in accordance with the requirements of the New York State Environmental Quality Review Act (SEQRA) and its implementing regulations, 6 New York Codes, Rules and Regulations (NYCRR) 617. The FEIS describes changes to the Project design since the January 2016 Supplemental Draft Environmental Impact Statement (SDEIS), presents responses to comments received from involved agencies and the public, and analyzes potential environmental impacts resulting from the revised Project layout and design. Studies and reports pertaining to the Project are attached.

The format of this FEIS is as follows:

- Section 1 provides an updated Project description and details changes in the Project from the SDEIS to the FEIS.
- Section 2 provides individual responses to all comments received during the SDEIS public comment period.
- Appendices A through T provide additional Project information either updated from the SDEIS or committed to in the SDEIS. Appendix A, Updated Tables and Figures, provides updated tables and figures from the SDEIS that are not associated with an updated report. Updated tables and figures corresponding to the subject matter of the other appendices are included within the respective appendices. For example, updated wetland impact text, tables and figures are provided in Appendix E, Water Quality and Wetlands, along with the updated report.

1.2 Project History

In May 2008, the Town of Villenova Town Board (Lead Agency) accepted an application for a Special Use Permit and Wind Overlay Zoning District under the Wind Energy Facilities Law of the Town of Villenova (Villenova Town Law) for

the proposed Noble Ball Hill Windpark in the towns of Villenova and Hanover, Chautauqua County, New York. This wind energy proposal utilized the same general Project Area as is currently proposed for the Project. In September 2008 the Villenova Town Board, as the Lead Agency under SEQRA, accepted a Draft Environmental Impact Statement (2008 DEIS) as complete for purposes of commencing public review. As described in the 2008 DEIS, the Project then called for the construction and operation of 60 1.5-megawatt (MW) turbines (90.0 MW of power). Of the 60 proposed turbines, 49 were proposed for the town of Villenova and 11 for the town of Hanover within the same Project Area as studied in the 2008 DEIS and later in the SDEIS. The proposal also included associated access roads, buried electrical collection lines, and electrical transmission and interconnection facilities. After acceptance of the 2008 DEIS, the Lead Agency opened a public comment period and held a public hearing under SEQRA and as required under the Villenova Town Law and the Town of Hanover Zoning Laws: Wind Energy Conversion Systems (Hanover Town Law). Written and oral comments were received from involved agencies and the public. Copies of these comments are included in this FEIS in Appendix T, Public Participation.

In 2010, development of the Project continued within the same Project Area as studied in the 2008 DEIS, the 2016 SDEIS, and in this FEIS. In 2011, the Lead Agency received an amended application for the necessary Town permits and approvals, and an amendment of the maximum height limitation in the Villenova Town Law. The amended application contained a revised layout and proposed new taller turbine technology within the same Project. In 2012, revised amended applications using different turbine technology and a revised layout within the same Project Area as the 2008 DEIS were submitted to the Villenova and Hanover Town Boards. In February 2012, the Lead Agency requested that a SDEIS be prepared, identifying differences from the 2008 DEIS and providing updated impact analyses in accordance with an approved scope of review for the Duke Energy Generation Services SDEIS. In May 2012, the Lead Agency accepted the revised amended application as complete, made a positive declaration of significance, and ordered an SDEIS to be prepared consistent with the scope of impacts approved in February 2012. The SDEIS was prepared as directed and submitted to the Lead Agency's consultants for review and comment.

In October, 2015, the Lead Agency recognized the continued development of the Project by Ball Hill, determined by the Lead Agency as the Applicant and Project Sponsor. Since Ball Hill proposed to operate a number of wind energy conversion systems (WECS), which were different in type, size, and location than was previously reviewed, the Lead Agency ordered the preparation of an SDEIS and required Ball Hill to address a range of impacts related to the implementation of new WECS technology including the increase in height, the modification of the prior Project layout and the passage of time. On January 18, 2016, Ball Hill submitted the SDEIS to the Lead Agency, which was reviewed by the Town's consultants. On January 27, 2016, the Lead Agency accepted the SDEIS as complete for purposes of commencing public review. Copies of the Town Resolution ac-

cepting the SDEIS as complete and the notice of public hearings are included in Appendix T, Public Participation.

Ball Hill then presented the SDEIS at a Public Hearing in the Town of Villenova on March 2, 2016. During the 45-day public comment period ending March 14, 2016, comments from the New York State Public Service Commission (NYSPSC), New York State Department of Environmental Conservation (NYSDEC), and members of the public were received. A total of 14 commenters provided written or spoken comment on a variety of topics. Responses to comments made by the public and by government agencies are provided in Section 2 of this FEIS. This includes responses to comments made by the public at the March 2, 2016, public hearing, and comments submitted by the public and government agencies during the 45-day comment period ending on March 14, 2016.

After consideration of comments received on the SDEIS and in the course of optimizing the Project design to avoid and/or minimize impacts, including permanent impacts to wetlands, the Project was modified as set forth in the amended applications submitted to and accepted by the Towns of Villenova and Hanover on September 28, 2016, and October 24, 2016, respectively.

Public hearings were held in each town after the acceptance of the amended applications where Ball Hill, and its supporting staff, presented the updated Project and solicited and answered questions from the interested public.

Responses to comments made by the public and by involved and interested agencies are provided in Section 2 of this FEIS, and additional information pertaining to public participation is presented in Appendix T, Public Participation. All impact studies associated with the revised Project design have been updated and have been submitted herewith, or were included in the amended applications.

1.3 Changes in the Project since the SDEIS

In the revised layout presented in this FEIS, the Project minimizes environmental impacts, taking into account the community's input, while maintaining the Project's energy generation capacity and maximizing energy efficiency. Ball Hill's detailed process of micrositing and analyzing engineering options and controls to minimize or avoid Project environmental impacts identified in the January 2016 SDEIS has decreased the estimated total land disturbance from construction by about 27% and the estimated total land impacted by operation by about 43%. Tables summarizing these changes are provided in Appendix A.

The current layout reflects a balance of minimizing potentially negative environmental and human impacts while still providing an economically viable Project to produce energy from 100 MW of wind capacity to the electric grid. The following concerns and requirements were taken into account as the Project Design and layout were finalized:

- **Public input and participating landowner concerns/recommendations.** Ball Hill communicated with the local community through a public hearing and the public review of the SDEIS, as well as two additional public hearings in Villenova and Hanover, respectively. Ball Hill also communicated directly with participating landowners in cases where Project facilities would be located on their property, to minimize negative impacts to property owners and their neighbors.
- **Setback requirements.** The parent company of Ball Hill has a policy to voluntarily implement setbacks of 500 meters (1,642 feet), where practicable, from existing residences to ensure maximum screening benefit of existing woodland vegetation, and minimize sound impact and the potential for extended duration shadow flicker on nearby residences. This is more stringent than the Towns' setback requirements, and was achieved for all but four residences, which are less than 1,642 feet but still farther than 1,200 feet from a turbine. As a result, there are no residences within 1,200 feet of a WECS under the current layout of the Project.
- **Impacts to agricultural land.** Adhering to the New York State Department of Agriculture and Markets (NYSDAM) *Guidelines for Agricultural Mitigation for Windpower Projects (revised 2013)*, wherever practicable the Project is sited along field edges and existing access paths to avoid segmenting agricultural lands and impacting agricultural production.
- **Sound.** Ball Hill reduced the number of proposed turbines and took careful consideration to locate the collection substation at the southern end of the Transmission Line (Town of Hanover) such that no residences would be impacted by the sound from the substation (see Figure 2). As a result there are no residences within the 50-A-weighted-decibel (dBA) noise contour and there are fewer houses above the 45-dBA noise contour compared to the SDEIS.
- **Wetlands and Streams.** The Project was microsited resulting in changes to the Project layout from the layout set forth in the SDEIS to decrease impacts to wetlands. Extensive field work was conducted throughout the Project Area to understand where the wetland resources are in the area so that the Project could avoid them wherever practicable. Ball Hill has submitted the Conceptual Wetland Mitigation Plan to the agencies (see Appendix F, Conceptual Wetland Mitigation Plan) and will continue working with agencies (i.e., NYSDEC and U.S. Army Corps of Engineers [USACE]) to obtain wetland permits and implement additional mitigation measures where wetland impacts could not be avoided. Ball Hill is committed to providing a final mitigation plan approved by NYSDEC and USACE prior to permit issuance from both the NYSDEC and USACE.
- **Tree clearing and wildlife**. The Project was sited and turbines were relocated from the SDEIS layout in order to decrease the level of tree clearing and habitat fragmentation, which in turn decreases Project impacts on wildlife, including birds and bats. Ball Hill will continue to consult with federal and state agencies to ensure proper mitigation and construction and post-

construction monitoring occur to further protect wildlife and restoration will be conducted in accordance with commitments made in the SDEIS and FEIS.

- **Federal Aviation Administration requirements.** Ball Hill consulted with the Federal Aviation Administration (FAA) to get a determination of no hazard for all turbines in the layout (see Appendix G, Agency Correspondence). To address concerns about impacts to local airports, the Project team consulted with the local and County officials regarding the Project and confirmed the Project Area is outside the 6-nautical-mile area of operations for both County airports.
- **Visual impacts and shadow flicker**. Ball Hill analyzed the visual impacts from the Project utilizing photo simulations and analyzed the impacts on houses from shadow flicker (see Section 1.4.7 and Appendix I, Visual Resource Assessment).
- **Historic structures and archeological deposits.** The Project avoids a known archeological site that was identified during a 2012 field season. Ball Hill also moved a laydown area from a culturally sensitive area in order to avoid potential archeological deposits. Ball Hill acknowledges that there may be adverse impacts to cultural resources due to the Project and will consult with the State Historic Preservation Office(r) (SHPO) on mitigation techniques as part of Section 106 of the National Historic Preservation Act of 1966 (NHPA). In addition, Appendix O of this FEIS, Architectural Resources Mitigation, provides information about the visual impact mitigation strategies that may be pursued in consultation with SHPO. Ball Hill is committed to consulting SHPO on mitigation strategies for the Project and developing a Historic Resources Impacts Mitigation Plan approved by SHPO.
- **Economic benefits.** In addition to balancing potential negative impacts with an economically viable Project, the Project would also have a significant net positive economic impact on the local community and would contribute to meeting New York State air quality goals.

1.3.1 Changes to the Project Layout

Ball Hill has been able to reduce the Project footprint and related impacts by selecting a stronger turbine, the Vestas Model V126-3.45MW IEC IIA/IIB (the V126; see Section 1.3.2), and reducing the total number of turbines to be constructed from 36 to 29.

Figure 1 shows all proposed Project facilities. Figure 2 illustrates both the January 2016 SDEIS and FEIS layouts to highlight changes in the Project layout.

Table 1.3-1 provides a comparison of the Project Layouts proposed in the January 2016 SDEIS and this FEIS. Table 1.3-2 lists the changes made to the Project Layout by turbine and facility.

Table 1.3-1 Comparison of Project Layouts Proposed in the SDEIS and FEIS

Project Component	SDEIS Layout	FEIS Layout
Wind Turbines	36	29
Access Roads	14.9 miles	13.0 miles
Buried Electrical Collection Lines	21.3 miles	19.8 miles
Overhead Transmission Lines	6 miles	5.7 miles
O&M Building Site	2.8 acres (5 acres leased)	5 acres leased[2]
Collection Substation	175 x 290 feet	Similar footprint on 1.3 acres
Interconnection Substation	225 x 611 feet	Similar footprint on 4.0 acres
Temporary Construction Laydown Areas (acres)	26.1 acres	15.0 acres
Potential Impact to wetlands (acres) (Temporary/Permanent)[1]	24.5 acres/ 4.6 acres	24.96 acres[3]/ 0.87 acres

Notes:
1 Total wetland impact is the permanent and temporary impacts combined.
2 The O&M Building site would be utilized as a temporary laydown area during construction.
3 The total temporary impact to wetlands under the FEIS (24.96 acres) includes impacts to forested wetlands by clearing vegetation with no additional fill. Impacts to wetlands are further characterized and explained below in Section 1.4.4 and Appendix E, Water Quality and Wetlands, of this FEIS.

Table 1.3-2 Ball Hill Wind Project Summary of Changes from the SDEIS

Facility	Modifications and Rationale
Turbine 1	Turbine and access road eliminated to minimize slope impacts. Engineering constraints (steep slopes) made access difficult.
Turbine 2	Moved approximately 530 feet southeast; new access road location from Round Top Road. Moved from wooded area to open farm field. Eliminated difficult stream crossing and impacts associated with stream and woodlands and decreased forest fragmentation.
Turbine 3	Moved approximately 450 feet southwest. Increased setback from adjacent landowner and houses to northeast.
Turbine 4	Moved approximately 230 feet southeast, to allow proper turbine spacing for the V126 turbine.
Turbine 5	Moved approximately 208 feet southeast. Increased spacing required for V126 turbine.
Turbine 6	Moved approximately 350 feet southwest to minimize steep slope impacts within turbine footprint.
Turbine 7	Moved approximately 220 feet northwest to address engineering constraints and avoid wetland impacts.
Turbine 8	Remained in the same location as presented in the SDEIS.
Turbine 9	Moved access road to minimize agriculture impacts.
Turbine 11	Remained in the same location as presented in the SDEIS.
Turbine 12	Turbine and access road eliminated in response to engineering constraints, to increase Project energy production and accommodate proper turbine spacing.
Turbine 13	Remained in the same location as presented in the SDEIS.

Table 1.3-2 Ball Hill Wind Project Summary of Changes from the SDEIS

Facility	Modifications and Rationale
Turbine 14	Moved approximately 220 feet southwest, to allow proper turbine spacing for the V126 turbine.
Turbine 15	Moved approximately 500 feet east to increase Project energy production.
Turbine 16	Moved approximately 50 feet southeast, to allow proper turbine spacing for the V126 turbine.
Turbine 17	Moved approximately 580 feet northeast, to minimize wetland impacts. Road moved to minimize wetland impacts as well.
Turbine 18	Minor road shifts to minimize wetland impacts and impacts on agricultural lands.
Turbine 19	Moved approximately 350 feet north, for proper turbine spacing for the V126 turbine.
Turbine 20	Moved approximately 820 feet northeast, to allow proper turbine spacing for the V126 turbine, and to comply with setbacks in Villenova's Wind Law.
Turbine 21	Moved approximately 200 feet southwest, in response to engineering constraints, to avoid steep slopes and impacts, and minimize tree clearing.
Turbine 23	Moved approximately 230 feet east, for wetland avoidance.
Turbine 25	Turbine and access road eliminated to avoid wetland impacts, and minimize tree clearing.
Turbine 26	Turbine and access road eliminated to avoid wetland impacts, and minimize tree clearing.
Turbine 27	Moved approximately 1,100 feet northeast to avoid wetland impacts, and minimize tree clearing
Turbine 28	Moved approximately 220 feet west, to avoid wetland impacts and gas pipeline/wells.
Turbine 29	Turbine removed and access road eliminated to allow for proper turbine spacing for the V126 turbine, to minimize tree clearing, and avoid wetlands impacts.
Turbine 30	Moved approximately 90 feet southwest. To minimize wetland impacts and respond to engineering constraints.
Turbine 31	Remained in the same location as presented in the SDEIS.
Turbine 32	Turbine and access road eliminated, for proper turbine spacing.
Turbine 33	No change.
Turbine 34	Moved approximately 430 feet southeast, to increase setbacks from adjacent parcel.
Turbine 35	Moved approximately 309 feet southwest, to avoid wetland impacts.
Turbine 36	Moved approximately 500 feet southeast, for proper turbine spacing for the V126 turbine. Associated access road and collection line moved accordingly.
Turbine 37	Moved approximately 1,200 feet northwest for proper turbine spacing. Associated access road and collection lines moved accordingly.

Table 1.3-2 Ball Hill Wind Project Summary of Changes from the SDEIS

Facility	Modifications and Rationale
Turbine 38	Turbine eliminated, for proper turbine spacing, for the V126 turbine and to avoid wetland impacts.
Collection Substation	Moved approximately 850 feet northwest, to minimize tree clearing and increase setback from residence.
Interconnection Substation	After extensive assessment of potential alternative locations, the original proposed location of the interconnection substation was retained as optimal.
O&M Building	Location of the O&M Building will be finalized to avoid and/or minimize wetland impacts but will be located within the footprint shown on Figure 1.

Key:
O&M = operations and maintenance
SDEIS = Supplemental Draft Environmental Impact Statement
V126 = Vestas Model 126-3.45MW IEC IIA/IIB turbines

1.3.2 Summary of Changes by Project Component from SDEIS to FEIS

Changes to Project Area: After reducing the number of turbines, the Project Area, which encompasses parts of the towns of Villenova and Hanover, has been reduced from 13,659 acres in the SDEIS to 9,715 acres. The Project Area encompasses the outer boundary of all parcels containing Project facilities.

Changes to Turbines: The Project has been reduced from 36 wind turbines to 29 turbines (23 in the town of Villenova and six in the town of Hanover) with a capacity to produce approximately 100 MW of electricity. The wind turbines that would be installed for the Project would be latest V126 each of which would have a capacity to produce approximately 3.45 MW of electricity. Using this turbine allowed Ball Hill to remove seven turbines which had been in the SDEIS Project layout, reducing the Project footprint and impacts as detailed below.

The V126 class turbine is a three-bladed, upwind, horizontal-axis wind turbine with a rotor diameter of approximately 413 feet. The nacelle is located at the top of the tower and contains the electrical generating equipment. The turbine rotor and the nacelle are mounted on top of a tubular tower giving a rotor hub height of approximately 285 feet. The maximum height for the turbine is below 500 feet when a rotor blade is at the top of its rotation. Once installed, the wind turbine would occupy a round base approximately 60 feet in diameter. Appendix B, Turbine Specifications, of this FEIS contains the Type Certification, a vertical drawing, and the product brochure for the V126.

Changes to Turbine Sites: As detailed in Table 1.3-2, seven turbine sites presented in the SDEIS have been eliminated from the current Project layout, and the remaining 29 turbine locations have been sited to ensure that:

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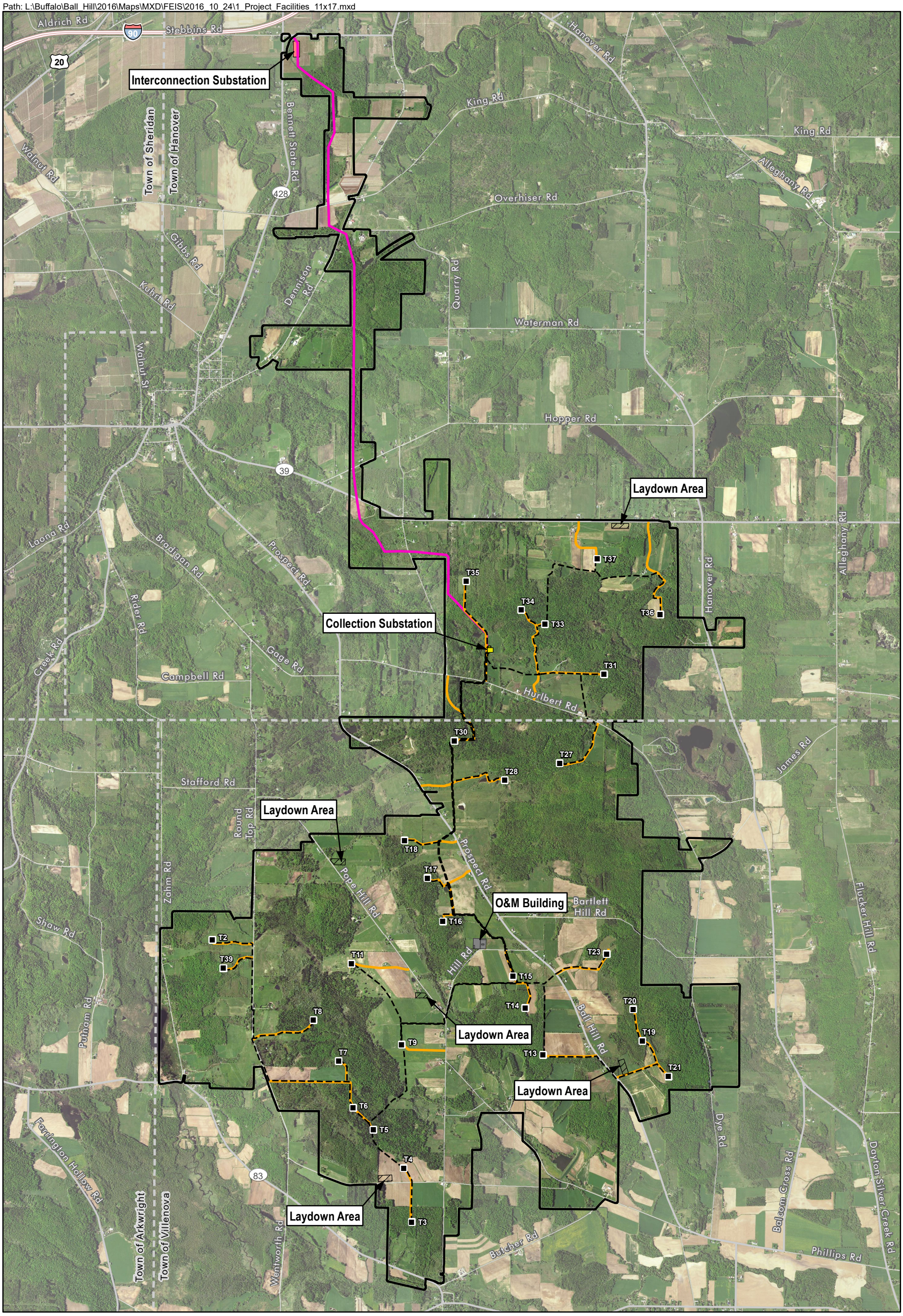

- Turbine
- Town Boundary
- Street
- Access Road
- Collection Line
- Transmission Line
- Collection Substation
- Interconnection Substation
- O&M Building
- Laydown Area
- Project Area

Figure 1
Project Facilities
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC

0 0.5 1 Miles

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

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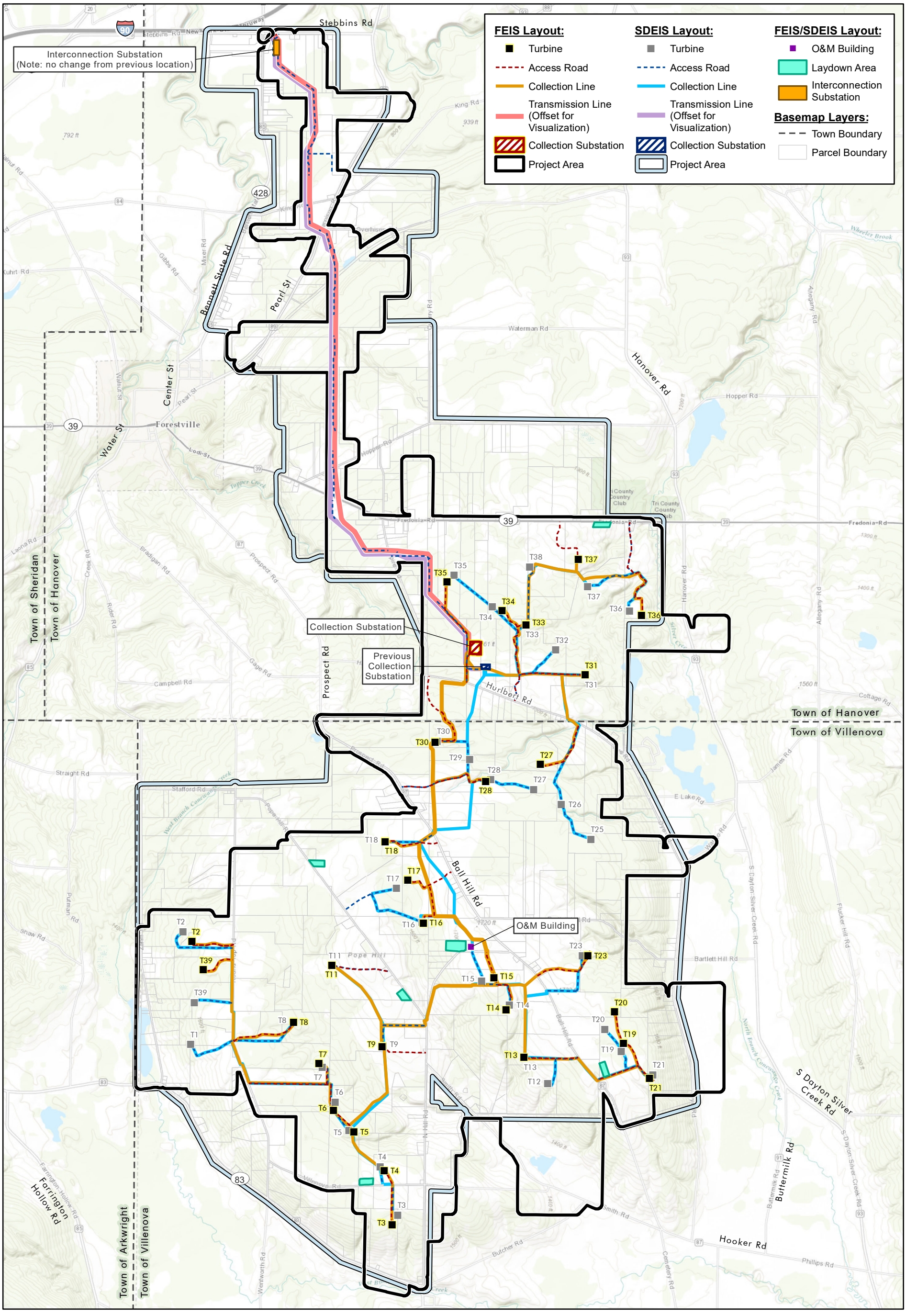

Figure 2
Project Comparison
FEIS Layout (November 2016) SDEIS layout (January 2016)
Chautauqua County, New York
Ball Hill Wind Energy, LLC

Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community.

Source: ESRI 2012; Fisher Associates 2016.

The actual substation footprint will be smaller than the area shaded on this figure, but within the boundary of the area shaded.

- Impacts on wetlands and other environmentally sensitive areas were avoided or minimized to the maximum extent practicable;
- Landowner concerns were addressed;
- Setback requirements were met;
- Engineering constraints, such as steep slopes, were accounted for; and
- Applicable sound pressure levels in the Towns' Laws are not exceeded at sensitive locations, such as at residences, schools, churches, libraries, and parks.

Changes to Access Roads: The total length of access roads to be constructed has been reduced to approximately 13.0 miles (9.0 miles in the town of Villenova and 4.0 miles in the town of Hanover), a decrease of 1.9 miles. As described in the SDEIS, the 36-foot-wide temporary access roads would be restored and scaled back to a permanent width of 18 feet.

Changes to Collection System: The length of underground collection lines has been reduced to 19.8 miles (14.5 miles in the town of Villenova and 5.2 miles in the town of Hanover). All collection lines would be constructed underground. Each system was designed to:

- Collocate electrical lines and roads within the same corridor, where possible;
- Optimize the use of previously disturbed areas, such as farmlands and roads; and
- Avoid or minimize wetland and stream crossings.

Changes to Collection Substation: As indicated in Table 1.3-2, this substation has been moved approximately 850 feet northwest, to minimize tree clearing, increase the setback from the nearest residence, and minimize noise impacts. It would still be located in the town of Hanover.

Changes to Transmission Line: The transmission portion of the Project would be a 115-kilovolt (kV) transmission line, instead of the 230-kV line presented in the SDEIS. This change was adopted to reduce perceived cost and schedule impacts. As a result of the revised location for the collection substation, the length of the 115-kV transmission line, which would transfer the energy produced by the Project to the interconnection substation, has been reduced to 5.7 miles. Access roads for the transmission line are described above. Wetland impacts associated with the transmission line have been avoided or minimized to the extent practicable.

No Changes to Interconnection Substation: As indicated in Table 1.3-2, after extensive assessment of potential alternative locations, the location of the interconnection substation identified in the SDEIS was retained as this location created the least impacts of the alternatives studied.

Changes to Operation and Maintenance Facility and Laydown Areas: The proposed location of the Operation and Maintenance (O&M) Facility has not changed. Ball Hill may lease up to 5 acres for the O&M facility; however, construction and operation of the O&M building and laydown area would only permanently impact a portion of those 5 acres. The final location of the O&M building would be determined in consultation with the property owner and designed for environmental impact minimization. During construction of the Project, this area would be utilized as a temporary construction laydown area.

Laydown Areas: In the SDEIS, 26.1 acres of laydown areas were anticipated; the revised layout identifies a total of 20.0 acres of land that would be used as laydown areas (see Figure 1). Since Ball Hill submitted the amended application to the Lead Agency, one laydown area in the southeast corner of the Project was identified as a culturally sensitive area and was removed from the layout.

Changes to Project Site: The Project Site consists of 256.6 acres (147.6 acres in Villenova and 109.0 acres in Hanover) within the approximate 9,715-acre Project Area. The Project Site includes grading and selective tree clearing for temporary and permanent construction rights of way (ROWs) for access roads, the turbine sites (permanent impacts include a crane pad and turbine apron/foundation); the collection system ROW; the transmission line ROW; 20.0 acres for equipment laydown areas and the O&M building site; 1.3 acres for the collection substation; and 4.0 acres for the interconnection substation.

Table 1.3-3 compares the total number of acres that would be temporarily and permanently impacted in the SDEIS layout and the revised layout presented in this FEIS.

1.3.3 Updates to Construction Plans

Construction of the Project would occur wholly within an area identified in this FEIS as the limit of disturbance (LOD), which is contained wholly within the Project Area boundary (see Appendix C, Project Drawings). Not all disturbance within this area would require temporary or permanent fill or grading. For the purposes of the analysis within this FEIS, construction impacts are defined as areas where permanent and temporary grading and fill are anticipated to occur.

The following definitions describe temporary and permanent impacts:

- Temporary impacts occur in areas where vegetation/land uses will be restored or be allowed to be restored naturally after construction of the Project is complete; and
- Permanent impacts are in areas where permanent grading and fill will remain during operation of the Project.

Table 1.3-3 FEIS: Summary of Project Impacts, Entire Project Site[1, 2, 3]

Project Component	Construction Impacts (Permanent and Temporary Impacts) [acres]			Project Operational Impacts (Permanent Impacts) [acres]			Areas to be Restored to Existing Condition After Construction (Temporary Impacts)		
	Total	Town of Hanover	Town of Villenova	Total[1]	Town of Hanover	Town of Villenova	Total[1]	Town of Hanover	Town of Villenova
Total SDEIS	330.1	124.0	206.1	228.3	101.0	127.3	101.8	22.9	78.8
Total FEIS	256.6	109.0	147.6	55.5	18.7	36.8	201.1	90.3	110.8
Change from SDEIS to FEIS	**(-73.5)**	**(-15.0)**	**(-58.5)**	**(-172.8)**	**(-82.3)**	**(-90.5)**	**99.3**	**67.4**	**32.0**

Notes:

1 Table totals may not sum due to rounding.

2 Construction impacts are defined as areas where grading (temporary and permanent) would occur for the construction of Project facilities with the exception of the Transmission Line for which construction impacts are considered to be the entire 80-foot ROW.

3 As noted in Section 1.3.3 and represented in the drawings presented in Appendix C of this FEIS, Project Drawings, there are an additional 62.3 acres within the proposed limits of disturbance (LOD) where grading is not expected to occur, but additional disturbance may include limited tree clearing and/or other minimal temporary disturbance required for construction of the Project facilities.

Total construction impacts make up the Project Site (256.6 acres), as described in Section 1.3.2. There are areas outside the Project Site but within the proposed LOD (62.3 acres). Disturbance in these 62.3 acres would likely be limited to tree clearing and/or minimal temporary disturbance as required for construction of the Project facilities but not permanent fill. As an example, the LOD around the construction impacts for an access road would be the area where additional tree clearing/trimming may be required for safe transport of construction materials. There is a potential that limited grading may occur in these areas during construction of the Project. For this reason, total impacts with respect to tree clearing and wetlands and waterbodies are analyzed for the entire LOD, whereas other resource areas, such as soils and other ecological community types, are analyzed for the Project Site as defined in this FEIS.

Construction of the Project is expected to begin in 2017 and be complete in 2018, although weather and other factors may increase or decrease the length of the anticipated 12-month construction schedule. Ball Hill will obtain all necessary permits and approvals prior to the start of construction. As noted in the SDEIS:

- Construction would be monitored by Ball Hill personnel, Ball Hill's environmental supervisor, and the Towns' environmental inspectors to ensure that all construction is conducted in accordance with applicable federal, state, and local permits and conditions, agreements, and regulations.
- All stream and wetland crossings would be executed in accordance with the requirements of permits issued by NYSDEC and the USACE.
- Activities within active agricultural fields would be conducted in accordance with applicable NYSDAM guidelines to the greatest extent practicable, and in accordance with Town approvals and landowner input.
- Site-specific Storm Water Pollution Prevention Plans (SWPPPs) will be prepared and implemented prior to construction and operation, and individual Notices of Intent for construction will be filed in accordance with the NYSDEC New York State Pollutant Discharge Elimination System General Permit for Stormwater Discharges from Construction Activity requirements. A description of stormwater pollution prevention measures that will serve as a basis for creation of a site-specific SWPPP was provided in the SDEIS as Appendix E, and remains valid for the FEIS. The SWPPPs will be submitted to the Towns prior to the issuance of building permits.
- Ball Hill will enter into agreements with the Towns of Villenova and Hanover and Chautauqua County as appropriate, and obtain permits from the New York State Department of Transportation (NYSDOT) as needed to allow improvements and modifications to existing roads and ROWs prior to the start of construction.
- Ball Hill will obtain building permits, as required, and submit entranceway, roadway, and gate details as a component of the permit application process. Final engineering plans that include parcel boundaries and road and utility

ROWs verified by licensed surveyors will be provided prior to issuance of building permits.

- Ball Hill, or its contractors, will coordinate with "Dig Safely New York" and the respective gas utility companies to determine the locations of all active gas lines and wells within the Project Site. Appropriate setbacks and crossing procedures will effectively minimize risks of interference. Where encroachments are determined to be necessary during Project engineering, Ball Hill will coordinate with the applicable company to be consistent with its encroachment polices.

The following subsections contain numbers and measurements specific to installation of the V126 turbine. The information is otherwise identical to that presented in the SDEIS.

Turbine Installation

Generally, each component type would be installed in the same manner at each turbine site. A turbine site is a staging area (maximum of 150-foot radius from the turbine pedestal) used during construction for laying out equipment, turbine rotor assembly, and stockpiling topsoil. Within the staging area, an approximately 210- by 175-foot area would be cleared and graded to a slope of 2% or less to facilitate the layout of turbine components (see Appendix C, Project Drawings). Disturbance outside this area would generally be limited to tree cutting necessary for rotor assembly and storage of excess topsoil, subsoil, or woody material including stumps, roots, logs, and/or wood chips. This area will be designed so as to avoid or minimize impacts to wetlands, streams, and other sensitive resources.

Within the maximum 150-foot radius from the turbine pedestal, a gravel crane pad – typically 80- by 50-foot with a slope of 1% or less in all directions – would be installed. The crane pad is used to support the crane used to lift turbine components to their upright and installed positions. After turbine installation is completed, the crane pad would remain in place for future turbine maintenance or decommissioning.

Each wind turbine would permanently occupy a round foundation base that is approximately 60 feet in diameter, only a portion of which would be exposed. Preparation of each turbine site for installation of spread footer foundations would involve excavation of surface materials to a depth of approximately 10 feet. After excavation is complete, concrete would be spread on the bottom of the excavation to level it in preparation of the rebar installation. After the rebar, steel and a turbine bolt cage would be installed and the concrete placed for the foundation and turbine pedestal. Each foundation would utilize approximately 480 cubic yards of concrete and rebar steel. The final design of each foundation will be submitted with the building permit application for each turbine site.

Best management practices (BMPs) will be used to ensure that topsoil and subgrade materials are kept separated and stockpiled so that the disturbed land is returned to its pre-construction condition and use. Dewatering will be used when

necessary to maintain the strength of the subsurface load-bearing materials. If bedrock is encountered during excavation activities, an excavator with a large rock bucket will be used or, in locations where the bedrock is more concentrated with depth, an excavator equipped with a hydraulic/pneumatic breaker or rock grinder may be used.

Ball Hill does not expect that blasting would be necessary for the excavation of the foundations. In the event that blasting becomes necessary, a detailed blasting plan would be prepared and submitted to the Towns of Villenova and Hanover, Chautauqua County Emergency Services Coordinator, and Chautauqua County Department of Health for their review.

During Project construction, the turbine components (i.e., tower sections, nacelle, and rotor blades) would be transported from the vendor's ports of import and delivered directly to site. An area may be identified in a parking area off-site to allow for short-term equipment staging for verification of match marking, a quality receipt inspection, washing,[1] and any necessary rigging adjustments prior to delivery to site. Materials, such as cable reels, and 34.5-kV junction boxes, would be delivered directly to specific turbine sites or to general laydown areas identified on Figure 1, to support specific scheduled construction activities. Other specific equipment and materials would be delivered to designated turbine sites. Each turbine site would serve as the heavy lift staging area for the erection of that specific turbine.

During construction, a total of 20 acres of temporary laydown areas within the Project Area would also provide storage for materials, such as overhead poles, rods, ring forms, and other construction materials. The proposed locations of the temporary laydown areas are depicted on Figure 1 and were chosen because they require minimal clearing and avoid permanent impacts on these locations. Six laydown areas are currently proposed for the Project and range in size from 2 to 5 acres each. Construction of each laydown area would include stripping and stockpiling the topsoil, reinforcing the site with geotextile fabric, and installing gravel. The laydown areas would also provide space for Ball Hill and its contractors' construction trailers and parking for construction crews who would be transported to the work sites. Others, including dedicated support staff, quality inspectors, and field engineers, would park off the public roads with landowner permission in designated areas, such as access roads and turbine sites, as needed. Construction trailers would be utilized during the construction phase of this Project and are anticipated to be placed within the O&M building site/laydown area. This would be a centralized location for work trailers and Project coordination. Laydown areas will be restored upon completion of construction.

[1] In accordance with the State Pollutant Discharge Elimination System (SPDES) permit, washing would be conducted with water only. No detergents, solvents, or other additives would be used. A separate SPDES permit is required for such activities.

Underground Electrical Collection System Installation

Underground electrical collection lines would be used as the main electrical collection system to gather electricity generated at all the wind turbine sites. Underground collection lines would be installed, to the extent possible, alongside areas of temporary road disturbance. In areas where underground collection lines could not be installed adjacent to an access road, they would be installed within a maximum 40-foot wide ROW. Underground collection lines would be installed via direct burial using either a trenching machine or a track hoe. The cables would generally be buried in 48-inch-deep trenches, with a final depth to the top of the cable of 42 inches. Where multiple circuits are installed parallel to each other, a separation of approximately 12 feet is required. In the unlikely event that bedrock is encountered within the trench depth during installation, alternatives, such as ripping or blasting, would be evaluated. Blasting would not proceed until a blasting plan has been prepared and approved by the appropriate town in which the blasting would occur and Chautauqua County.

Construction of underground collection lines within wetlands would be done either by trenching or using a directional bore during construction. These narrow trenches placed in wetlands would not create an impervious boundary; therefore, would not cause any alteration in the subsurface hydrology of wetlands. However, where necessary, trench plugs would be used to prevent migration of water out of the wetland. Pre-existing contours would be restored after the trench is backfilled and the area is revegetated. No permanent loss of wetlands would occur in association with the installation of underground collection lines.

Underground collection lines would be installed via trenching or using a directional bore at stream crossings. Streams that are not naturally dry at the time of crossing would be temporarily dammed, and water would be pumped around the construction area to allow collection lines to be installed in dry conditions. The equipment that would be used to install the collection lines cuts a trench, places the cable, and backfills the trench in a single pass, thereby reducing the duration of stream disturbance. Boring (and not dam and pump methods) will occur for stream crossings where required by permit condition or where specific site conditions (e.g., protected streams, steep slopes, unstable soils or other engineering challenges) necessitate its use. If directional bore is used, a horizontal boring machine will install a bore sufficiently below the bed, and cables will be pulled back in the bore. Each bore will start and finish beyond stream banks. Aboveground junction boxes will be located at various locations to join multiple reels of cables for long runs and at one end of each directional bore location.

Overhead Electrical Transmission Line Installation

The electrical transmission portion of the Project would require a new overhead transmission line. A new maximum 120-foot ROW would be required; all forested areas within a central 80-foot ROW would be cleared to avoid interference with transmission lines. The additional 20 feet of ROW on either side of the clearing would be utilized for selective tree removal. During construction, equipment travel would generally be limited to a 20-foot travel corridor, where

practicable, and temporary 80-foot by 80-foot workspaces at pole locations. If wetland areas and streams are encountered along the transmission ROW, wetland mats would be used within a 12-foot corridor immediately adjacent to the transmission line to accommodate equipment travel.

Construction of the proposed transmission line would occur in four general phases: 1) ROW clearing and preparation; 2) installation of single-pole structures; 3) stringing of the conductors; and 4) cleanup and restoration.

The entire cleared ROW width would be cleared of trees during construction and maintained in an herbaceous or scrub-shrub state during operation to provide necessary transmission system clearance and maintain reliability of the transmission line. Within wetlands, trees would be cut by hand and equipment used for removal would be positioned outside of the wetland boundary or on mats located within a construction corridor immediately adjacent to the transmission line. Tree stumps would be left intact except where removal is necessary for pole installation or where they pose a safety related construction constraint (such as within travel paths). In these areas, stumps would be removed and disposed of in approved upland, non-active agricultural locations.

Single wood or wood look-alike poles would be installed to support the conductors. A crew would transport the poles, along with insulators and insulator hardware, to each pole location on the ROW. A drill rig or auger would be used to drill holes for the transmission poles to the required depth, based on final engineering design. The poles would be lifted individually and set in place by a crane or large forklift. Braces and davit arms would be individually hoisted and framed to the poles. The insulators, clamps, travelers, and other associated hardware would be installed on the pole. Appendix C, Project Drawings, shows the Ball Hill Wind Energy 115 kV Transmission Line Plan and Profile Drawings.

Access Road Construction

Access roads would have a temporary width of 36 feet during construction. Access roads would be installed within a disturbed area of varying widths (further reduced in wetlands) that would serve as extra work space to allow for construction of the temporary access road, storage of topsoil, and safe passage of equipment. When collocated with an access road, underground collection lines would be installed parallel to the construction ROW (for an example drawing see Appendix C, Project Drawings). When turbine and collection system construction is complete, the disturbed areas and construction ROW will be restored (as described below) leaving a narrower permanent access road for each turbine site. Such access roads would be maintained at a width of 18 feet for O&M of the turbines. Actual road widths vary depending on grading requirements and topography, see Appendix C, Project Drawings, for specific access road widths.

Except for the 18-foot permanent access road, the remainder of the construction ROW would be allowed to naturally revegetate, subject to elimination of dangerous trees. Natural revegetation of the construction ROW is likely to result in the

establishment of native plants, due to existing seed banks and adjacent plant communities. An annual rye seed and mulch would be used to temporarily stabilize the soil. If necessary, supplemental seeding/mulching would take place on an as-needed basis. In areas adjacent to agricultural fields, plans for revegetation or seeding/mulching would be discussed with individual farmers so that the re-establishment of vegetation complements each farmer's operation. The NYSDAM *Guidelines for Agricultural Mitigation for Windpower Projects* (revised 2013) will be followed to minimize loss of agricultural land and impacts on farming operations. Periodic removal of woody vegetation may be required to maintain an herbaceous or successional shrub state composed of native species along access road edges.

The proposed access roads for the Project are gravel roads designed to bear the weight of construction vehicle and truck traffic transporting concrete, gravel, and turbine components to the wind turbines over the life of the Project. These access roads would also support any emergency or fire service equipment that may need access to and egress from to the Project Site. The required gravel road base section would be constructed using site-specific geotechnical information considering the load-bearing requirements of construction traffic and equipment delivery. The gravel roads would then be constructed accordingly for the soil conditions and base section, including stripping of topsoil in most areas. Geotextile fabric, or a comparable product, may be used to separate the native soil/fill from the gravel base material to prevent fine soil particles from migrating into the gravel base material and to preserve road base integrity. Cement stabilization may be used in place of geotextiles in some areas as well.

Roads would be constructed with stream culverts as needed to prevent washout of the base material during storm events and to ensure roadbed stability. Roadside ditches would be constructed as dictated by the terrain to convey stormwater runoff away from the roadways. To prevent access by the general public, construction/access roads may be gated where they intersect public roads.

Construction of Substations

The interconnection substation will include a three-breaker-ring bus arrangement. The interconnection substation will be designed in accordance with National Grid standards and with the Northeast Power Coordinating Council Criteria for Bulk Power Stations and criteria set for by the U.S. Department of Homeland Security (DHS). The collection substation will be designed in accordance with Institute of Electrical and Electronics Engineers and National Electrical Safety Code standards. Both substations will be located in steel fenced areas with appropriate warning signs.

The collection system delivers generated power via four to eight collector system circuits that are connected to the collection substation. The collection substation transformer steps up the voltage to 115 kV for interconnection with the National Grid transmission system through the new interconnection.

The substation includes circuit breakers in combination with open-air type isolation switches to connect the collection system feeders to the main 34.5-kV substation bus, a 34.5-kV main bus open-air isolation/grounding switch, a 34.5- to 115-kV, wye-delta-wye generation step-up (GSU). An automatic transfer switch is to be included if a back-up station service power source from the local distribution utility or a back-up diesel generator is included in the final design of the substations.

The construction of these facilities involves grading, construction of a foundation for the transformer, steel work, breakers, control house, and other outdoor equipment; the erection and placement of the steel work and all outdoor equipment; and electrical work for all the required terminations. The GSU transformer will be equipped with mineral oil and adequate oil containment will be provided. All excavation, trenching, and electrical system construction work would be done in accordance with the SWPPPs. Prior to construction, site-specific SWPPPs would be submitted to the NYSDEC, as required. Construction work would require the use of bulldozers, a drill rig and concrete trucks, a trencher, a back-hoe, front end loaders, dump trucks, transportation trucks for the materials, boom trucks and cranes, and man-lift bucket trucks.

The footprint for the collection substation would be up to 266 feet by 239 feet and up to 1.3 acres of disturbance, and the footprint for the interconnection would be approximately 265 feet by 651 feet, and up to 4.0 acres of disturbance. These footprints may be larger during construction; additional temporary impacts for these facilities are captured under total impact calculations. Additional information is provided in Appendix C, Project Drawings.

1.3.4 Operations and Maintenance Plans

The following plans for O&M of the WECS facilities are the same as those presented in the SDEIS.

Ball Hill plans to operate the Project with a staff of up to six full-time employees who would perform routine, preventive maintenance and unplanned work on the wind turbines under an O&M contract. A facility manager and an administrative assistant would be responsible for all O&M of the site, including administration and direction of turbine maintenance, technical oversight as required by the manufacturer, and operational coordination with both the utility grid system and local landowners. If needed, large repair tasks would be accomplished using both Project employees and third-party contractors.

Ball Hill would construct an O&M facility within the Project Area, which would house these activities. The O&M building footprint would be approximately 140 feet by 50 feet constructed as a single story with amenities including a maintenance shop, offices, and a conference room.

The operational staff would maintain the wind turbines, including routine maintenance, long-term maintenance, and emergency work. Routine maintenance for

the turbines would include testing lubricants for contaminants, changing lubricants, calibrating and testing electronic systems, and tightening bolts and components.

Routine maintenance is generally completed on a scheduled basis by climbing the tower using the internal ladder and doing the work with normal hand tools and electrical testing equipment. Long-term maintenance may include replacing/rebuilding and cleaning larger components, such as generators and gearboxes, testing electrical components, and refurbishing blades.

Emergency work may be required as the result of a system or component failure. Certain unplanned work, such as blade repairs or repairs to other large components, may require utilization of cranes at each turbine site to complete the work.

It is not expected that the Project would use herbicides to control vegetation along access roads, turbine maintenance areas, or electrical collection ROWs. Access roads are not expected to promote vegetation growth because of the use of geotextile fabric and gravel construction and the periodic use of the access roads by vehicles. If the use of herbicides becomes necessary to control vegetation, application would be performed by a certified contractor and in accordance with all applicable regulations. The natural vegetative conditions would be restored after construction and preserved to the maximum extent practicable throughout the Project Area, and no sites would remain devoid of vegetation. Maintenance of all cleared areas and periodic removal of vegetation would consist of trimming trees and clearing undesirable vegetation by side trimming, cutting, and mowing to: 1) control re-sprouting of undesirable tall growing species to maintain safe clearance within wire security zones; 2) remove vine growth from poles; 3) clear access paths to overhead equipment; 4) protect underground collection lines from root damage; and 5) maintain erosion and sediment control devices. In some cases, spot control of invasive species might be required. Maintenance of clearance distances around aboveground electrical lines would be limited to a minimum of a 5-foot-radius around conductors as recommended by the manufacturer's specifications, as necessary, to prevent interference with power cables.

All materials used during the inspection and maintenance of Project equipment would follow a strict material safety data sheet (MSDS) program and, when required, would include documented, dedicated control of excess materials as well as off-site disposal of waste materials at licensed facilities with an emphasis on recycling whenever possible. Typical MSDSs are included in the FEIS as Appendix D, MSDS Sheets.

1.4 Changes to Potential Environmental Impacts

The following summarizes changes in potential environmental impacts as a result of the changes made to the Project since the SDEIS.

1.4.1 Geology

Geologic impacts have not changed from the SDEIS. Construction of the Project is not expected to affect regional geology and topography because the spatial scale of the Project is much smaller than the regional geologic and topographic scales. Operation of the Project would not result in any additional impacts on local geology and topography beyond those required for the installation and maintenance of the facilities.

1.4.2 Soils

Since publication of the SDEIS, the Project Area and Project Site have decreased in size. The existing conditions of soil units within the Project Area that are likely to be impacted are described in full in the SDEIS and are not restated here. However, due to the revised Project layout, impacts on soils have changed in this FEIS. Tables A-1 and A-2 show impacts on soils and soil types within the Project Site. The SDEIS layout would have resulted in the disturbance of soils on 282.6 acres of land, including the permanent impact of 98.1 acres. The revised layout would result in the disturbance of soils on 205.2 acres, including the permanent impact to 55.5 acres. The transmission line ROW is not included in the impact calculations for soils construction because the ROW is not anticipated to require grading. If grading were required on the transmission line, an additional 51.4 acres of soils may be temporarily impacted within the ROW.

1.4.3 Water Quality

Appendix E, Water Quality and Wetlands, includes a detailed discussion of impacts on water quality and wetlands and a revised Wetland Delineation Report. Impacts of the Project on water quality have been further reduced from those presented in the SDEIS as a result of the changes in the layout. As noted in the SDEIS, Ball Hill will minimize any potential construction impacts on wetlands, surface water, and groundwater through the implementation of BMPs. Long-term impacts are expected to be minimal because Project components were sited in previously disturbed areas to the extent practicable.

Based on the layout of Project components, a total of 31 perennial streams, six intermittent, and six ephemeral streams would be crossed by Project facilities Seventeen NYSDEC-protected streams would be crossed by the Project facilities. These streams are discussed under the Protected Streams section of Appendix E, Water Quality and Wetlands (Section E.1).

As described above, construction of the Project may result in minor, short-term impacts on the streams crossed. These impacts could occur as a result of in-stream construction activities or construction on slopes adjacent to stream channels. If permanent culverts are necessary, they will be designed and installed in a manner maintaining natural stream flow and water velocity. Clearing and grading stream banks, culvert installation, in-stream trenching, trench dewatering, and backfilling could result in modification of aquatic habitat, increased water temperature, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants contained in stream sedi-

ments, and introduction of chemical contaminants, such as fuel and lubricants from possible spills. In general, these impacts would be temporary, short-term, and reversible as they are limited only to the period of in-stream construction activities.

Construction of the Project could result in indirect impacts on the quality of stormwater runoff as a result of increased surface runoff from disturbed areas and the possible release of pollutants or hazardous materials in the event of a spill during construction. These impacts are still expected to be minor, short-term, and reversible, with the exception of a minor permanent increase in impervious surface area, which will be mitigated through compliance with the site-specific SWPPP and Spill Prevention, Control, and Countermeasures.

As stated in the 2016 SDEIS, if areas of shallow groundwater exist in the vicinity of Project facilities, they would be identified during site-specific, detailed foundation engineering investigations performed in conjunction with the road and foundation design processes and addressed in the design plans which would be submitted to the Town prior to construction. In addition, stream crossings will be engineered, designed, and installed to maintain sufficient flow during construction in accordance with applicable regulations. These methods will be provided to the Towns upon submittal of the Joint Wetland Permit Application to NYSDEC and the USACE.

1.4.4 Wetlands

Wetland delineation surveys were conducted in 2015 and 2016 to evaluate impacts and proposed mitigation and to support federal and state permits. The Project Wetland Delineation Report and a request for jurisdictional determination were submitted to the USACE and NYSDEC on July 21, 2016. The USACE and NYSDEC conducted site visits to verify wetland boundaries on August 24, 2016, and September 14, 2016, respectively.

The preliminary impact analysis provided in the SDEIS was prepared utilizing data from surveys conducted in 2011, 2012, and 2015. Since that time, the updated stream and wetland information was used to support micro-siting of the Project to avoid and minimize impacts on streams wherever practicable. The results are provided in Appendix E, Water Quality and Wetlands.

Construction of the Project (i.e., access roads, collection lines, transmission lines, laydown and O&M areas, and turbine sites) would result in total construction disturbance of 25.83 acres of wetlands, 0.87 acres of which would be permanently impacted by placement of fill associated with turbine staging areas, access roads, and the transmission substation. The remaining 24.96 acres of wetlands would be limited to temporary ground disturbance impacts or permanent impacts associated with conversion of forested wetlands to an herbaceous or scrub-shrub state (see Table E-2 in Appendix E of this FEIS). All other Project facilities, including the interconnection substation and all turbine foundations, are located outside of delineated wetlands.

Temporary impacts consist of 24.96 acres of wetland that would be temporarily impacted by grading, ground disturbance, or placement of fill during construction and would be returned to preconstruction contours and allowed to revegetate to scrub-shrub or emergent cover. All of these wetland impacts are assumed to be under federal jurisdiction. The majority of wetlands subject to temporary clearing within the construction ROW are herbaceous and scrub-shrub wetlands (18.11 acres), which are expected to quickly revert to their preconstruction conditions. Some areas that are currently forested wetlands would be temporarily cleared during construction to allow for safe construction at turbine sites, but would be allowed to revert to a forested wetland condition over time (0.31 acres). An additional 6.54 acres of forested wetlands along the transmission and collection lines would be permanently impacted in association with forest conversion. Impacts to forested wetlands increased from the SDEIS layout to the FEIS layout due to completing the wetland and stream delineations and conducting micrositing of Project components to reduce overall impacts.

Of the wetlands impacted along the transmission line, 5.90 acres are mapped as NYSDEC wetlands (SC-12, a Class II wetland; and SC-13, a Class III wetland; see Table E-3 in Appendix E of this FEIS.), Of the 5.90 acres of wetland temporarily subjected to ground disturbance or fill, 2.82 acres would also be permanently impacted by forest conversion.

Operation of the generation and transmission facilities could result in temporary impacts on wetlands associated with clearing to maintain ROWs for the transmission line and collection lines as well as temporary impacts on wetlands for maintenance access. Total wetland impacts for the entire Project are listed in Table E-2. Impacts on state jurisdictional wetlands are presented in Table E-3.

Ball Hill has submitted the Conceptual Wetland Mitigation Plan to the agencies (see Appendix F, Conceptual Wetland Mitigation Plan) and includes an invasive species management plan, as part of the Environmental Monitoring Plan (EMP) of this FEIS. Ball Hill will continue to coordinate with NYSDEC and USACE during their review of the Joint Application for Permit and implement additional mitigation measures, if necessary, due to unavoidable wetland impacts. Ball Hill will provide a Final Wetland Mitigation Plan approved by NYSDEC and USACE prior to permit issuance.

1.4.5 Biological Resources

Since publication of the SDEIS, a new Natural Heritage Program search was conducted for the Project and no new species were identified. The U.S. Fish and Wildlife Service (USFWS) *Information, Planning, and Consultation* System (*IPAC* System) was also consulted, and no new species were identified. The results are included in Appendix G, Agency Correspondence.

Where feasible, Ball Hill has sited Project facilities to minimize fragmentation of forested habitat and avoid wetlands and aquatic habitats, thereby minimizing the potential for impacts on wildlife.

Table A-3 and Figure A-1 of Appendix A indicate the ecological community types that would be impacted by the Project under the revised layout, where the total acres to be impacted have been reduced from 330 acres in the SDEIS to 256.6 acres. Forest impacts, in which all clearing of forested habitat is considered to be a permanent impact due to the length of time needed for a forest to regenerate to pre-construction conditions, account for a total of 97.9 acres based on best available geographic information system (GIS) data for ecological community types for the Project Site. In addition, 21 acres of tree clearing would be required in the additional LOD area of the Project. In total 118.9 acres of tree clearing is anticipated from the Project.

Ball Hill considered forest impacts when developing the revised layout. As noted by NYSDEC in their comment on the SDEIS, any contiguous forest block of 150 acres or larger is considered valuable forest habitat that is viable for many bird species that require interior forests for breeding. Most of these species are protected by federal and state laws, such as the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, Part 182 of NYCRR, and Article 11 of the New York State Environmental Conservation Law (ECL; Edick 2016). Ball Hill's analysis of available GIS data identified contiguous forest blocks of 150 or more acres within the Project Area. Construction of the Project would include tree removal within these forest blocks; however, in all instances but one, there would still be a portion of contiguous forest block greater than 150 acres (see Figure A-2). Once the Project is constructed, there will be 15 contiguous forest blocks greater than 150 acres and seven new forest blocks less than 150 acres in size (see Figure A-2).

Indirect impacts on forest habitat blocks greater than 150 acres as a result of construction and operation of a wind energy project may occur 300 feet from the boundary of a disturbance (i.e., a new forest edge) (NYSDEC 2016). The construction of the Project will indirectly impact an additional 939 acres of forested habitat based on applying a 300-foot buffer to all construction impacts in forested habitat. These areas may experience indirect impacts, as pertaining to interior forest breeding birds. Table A-5 and Figure A-2 show direct and indirect impacts to forested habitat from the Project.

In total, 2.3% of the forested habitat in the Project Area would be impacted by Project construction (18.3% indirectly impacted), the majority of which is considered to be habitat for interior forest wildlife. Given the fact that access to the Project during operation would be limited to a small number of vehicles and that habitat in the Project Area is already segmented by existing roads and infrastructure, it is unlikely that the Project would significantly impact interior forest wildlife species.

1.4.6 Bird and Bat Resources

Since the SDEIS, previously collected bat acoustic data from 2012 was analyzed in more detail, two additional avian studies were conducted, coordination efforts with NYSDEC and the USFWS continued on bird and bat issues, and the summary tables of post-construction bird and bat fatality studies from New York State have been updated. These topics are summarized in this section.

2012 Bat Acoustic Data Analysis

During its review of the SDEIS, NYSDEC requested that Ecology and Environment, Inc.(E & E) reanalyze previously collected acoustic data from 2012 survey season using two automated species identification software packages currently approved by the USFWS for presence/probable absence surveys for the federally listed threatened northern long-eared bat. E & E took a multi-level analysis approach that incorporated results from the automated classifiers, maximum likelihood estimations, and independent reviews from three E & E bat specialists with expertise in acoustic identification. This multi-level approach was used in order to prevent potential false-positive identifications. In total, six calls originating from the low microphone during the 2012 acoustic survey were positively identified as northern long-eared bat and no calls from this species were detected by the high microphone during the 2012 survey year. The full analysis can be found in Appendix H, Bird and Bat Resources.

Additional Eagle Surveys

Additional eagle surveys were conducted to gather current information to supplement the data obtained during the surveys conducted in 2012-2013. Eagle point-count use surveys were initiated in March 2016. During each spring and summer season field visit, E & E also observed the two nearest Bald Eagle nests and collected sighting and nest status notes. An interim report that summarizes the results of the 2016 eagle surveys conducted through September 2016 is included in Appendix H, Bird and Bat Resources. Eagle surveys will continue through February 2017 and then the report will be updated and shared with NYSDEC and the USFWS.

Bald Eagles were periodically observed in the Project Area during surveys between March 2016 and September 2016, with 36 total sightings, most of which occurred in September. Golden Eagles were not observed in the Project Area during the 2016 surveys. The Bald Eagles were likely a mix of migrants, locals, and transients and included adult and immature birds. The relatively high sightings per hour at the three most northern survey points is influenced by the large number of sightings on September 1, which involved surveying only the northern half of the site, and repeated sightings of the same eagles. Aside from the number of sightings on September 1, the results of the 2016 surveys to date are generally consistent with the results reported in previous studies conducted by E & E in the Project Area, suggesting Bald Eagle activity within the Project Area during spring and fall migration seasons and more occasional activity during summer months.

Bald Eagles continue to increase their presence and expand their distribution in Chautauqua County as well as in western New York State, adjacent states, and the Great Lakes region. Two Bald Eagle nest locations in the vicinity of the Project Area were monitored in 2016 and both were confirmed to be occupied by incubating Bald Eagles. The "Hanover nest" apparently failed later in the season while the "Thruway nest" possibly fledged two young.

Ball Hill will continue to coordinate with NYSDEC and the USFWS regarding eagle activity. All data presented to and discussions with NYSDEC and USFWS will be utilized to develop appropriate minimization measures that will be included in the Project Bird and Bat Conservation Strategy (BBCS) and Eagle Management Plan (Eagle MP), including, at a minimum, the necessary post-construction monitoring activities to evaluate risk to eagles from the operation of the Project and adaptive management measures that will be taken based on that monitoring.

Breeding Bird Survey

An additional breeding bird survey was conducted in June 2016 to supplement the data obtained during the surveys conducted in 2007, 2008, and 2011. A transect-style survey methodology was utilized, which will allow for better comparison of pre-construction avian use to post-construction avian use. The results of the breeding bird surveys in 2016 are not directly comparable to the results from previous years due to differences in survey methodologies. The total number of species detected was somewhat higher in 2016 (80 species) than previous years but comparable when including only birds within 50 meters of the transect (67 species). The two most common species detected during the 2016 breeding bird surveys were Bobolink and Red-winged Blackbird, which were also the most abundant species detected in the 2011 surveys. The transects in pasture/hayfield habitats had the highest number of birds, dominated by Bobolinks and Red-winged Blackbirds and to a lesser extent Savannah Sparrows and Song Sparrows. Forested habitats had higher species diversity, which was expected given the wider array of habitats within the forested transects. Overall, the findings from the breeding bird surveys are consistent with the existing knowledge of the bird resources in the region. Typical for Chautauqua County, a good diversity of breeding species is associated with the area, primarily in forested areas. The methodology and results are included in the 2016 breeding bird survey report in Appendix H, Bird and Bat Resources.

Continued Agency Coordination and Bird and Bat Conservation Strategy/Environmental Monitoring Plan Development

Ball Hill participated in multiple meetings with NYSDEC and USFWS since the SDEIS was issued. These meetings included discussion of avian and bat issues, in addition to other topics, and continued the long history of agency coordination dating back to the earliest years for this proposed Project.

In an effort to reduce the impacts of wind energy projects on bird and bat resources, the USFWS recommends that wind energy project proponents develop a BBCS that outlines the project development process and includes monitoring and

conservation measures that would be implemented to avoid and minimize impacts on birds and bats at each project they propose to develop. The recommendation for the development of a BBCS is part of the USFWS's *Land-Based Wind Energy Guidelines* (USFWS 2012), which outlines a systematic approach for a wind energy developer to assess the potential risk to bird and bat resources during the pre-construction phase, evaluate the impacts on bird and bat resources resulting from the construction and operation of the Project, and develop conservation measures and mitigation measures to avoid and minimize impacts during the pre-construction, construction, and operational phases of the Project.

Ball Hill has initiated preparation of a BBCS following the USFWS's tiered approach. The purpose of this voluntary, Project-specific BBCS is to design and document a program to reduce the operational risks that could result from bird and bat interactions with the Project.

In addition, Ball Hill is developing an Eagle MP for the Project. The Eagle MP documents Bald Eagle and Golden Eagle use of the Project, describes efforts made to reduce risk due to Project development, documents communications and cooperation with the USFWS and NYSDEC, and the proposed post-construction monitoring and adaptive management approach for the Project. The Eagle MP follows the USFWS *Eagle Conservation Plan Guidance Module 1 – Land-based Wind Energy* (USFWS 2013).

Ball Hill will continue to coordinate with the USFWS and NYSDEC in preparation of a Project BBCS and Eagle MP.

Updated New York State Post-Construction Bird and Bat Mortality Rate Tables

The tables for avian mortality and bat mortality rates included in the SDEIS were updated to include the results of additional studies completed in New York State. These are included in Appendix H, Bird and Bat Resources.

1.4.7 Visual Resources

The Visual Resource Assessment (VRA), included as Appendix I, has been revised and updated by Saratoga Associates to address potential impacts to visual resources and includes an updated shadow flicker study.

The updated VRA evaluates the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and cumulatively with other proposed wind energy projects. The VRA was prepared according to NYSDEC Program Policy "Assessing and Mitigating Visual Impacts" (NYSDEC 2000) and SEQRA criteria to minimize impacts on visual resources.

The VRA includes an updated shadow flicker analysis, in addition to viewshed mapping, photographic simulations, and other visual impact analysis. Evidence from operational turbines suggests that shadow flicker is only a significant issue

at short distances. Shadow flicker is typically not found to occur at distances greater than 10 rotor diameters from a wind turbine. Beyond 10 rotor diameters, a person should not perceive a wind turbine to be chopping through sunlight, but rather as an object with the sun behind it. The VRA analysis identified 241 receptors within 4,134 feet (or approximately 10 rotor diameters) of any turbines, and calculated the number of hours per year each inventoried structure would theoretically fall within the shadow zone of one or more proposed turbines:

- 57 (23.6%) would theoretically not be impacted;
- 18 (7.5%) would theoretically be impacted 0 to 2 hours per year (hrs/yr);
- 69 (28.6%) would theoretically be impacted 2 to 10 hrs/yr;
- 43 (17.8%) would theoretically be impacted 10 to 20 hrs/yr;
- 32 (13.3%) would theoretically be impacted 20 to 30 hrs/yr;
- 17 (7.1%) would theoretically be impacted 30 to 40 hrs/yr; and
- 5 (2.1%) would theoretically be impacted 40+ hrs/yr.

As described in a memo included in Appendix I, Saratoga revisited the shadow flicker analysis after the locations of two turbines were moved. It was found that the micrositing of the two turbines would have only a minor impact on shadow flicker hours at up to six receptors; no significant increases would occur at any receptors.

There are no regulations or guidelines that establish an acceptable degree of shadow flicker impact on a potential receptor. Industry standard utilizes a 30-hour per year threshold that identifies residences where mitigation may be appropriate. The number of receptors theoretically impacted for 30 hours or more has increased from eight receptors based on the Project Layout presented in the SDEIS to 22 receptors under the revised layout.

Section 4.0 of Appendix I provides a list of potential mitigation measures that could be implemented for the Project. To minimize visual impacts, certain aspects were included in the design of the turbines. Tubular style towers that have been selected, rather than skeletal or lattice frame towers, to minimize textural contrast and provide a simpler, visually appealing form. The FAA mandates that white or light gray be used for aviation safety, and these colors are well suited to minimizing visual contrast with the background sky. Where specifications permit, non-specular paint will be used on all outside surfaces to minimize reflective glare. Additional mitigation measures will be considered on a case-by-case basis.

1.4.8 Sound

An updated sound level assessment was prepared for the revised Project layout and is included as Appendix J, Sound Level Assessment Report. The report indicates that predicted sound level impacts from the 29 proposed V126 wind turbine generators and two proposed electrical transformers will comply with Town of

Hanover and Town of Villenova noise limits at each of the closest structures to the Project. Additionally, the Project is still anticipated to meet the suggested criteria recommended in the NYSDEC guidance document for avoiding the potential for adverse community noise impacts. No pure tones (such as whines, screeches, or hums) were identified at the closest structure for the turbine model under consideration. Low frequency sound levels at the closest structures to the Project are also predicted to be well below the recommended criteria to avoid disturbance, vibration, and rattle indoors.

Due to the nature of wind turbine noise and the relative background sound levels in the area, Project turbines may be audible at times at some of the closest residences. However, conservative modeling assumptions were made to account for the occasional occurrence of conditions which may favor propagation of sound from the Project or increase the perceptibility of turbine noise. Most of the time, nominal sound levels from the Project are likely to be significantly less than those predicted in this analysis, which are based on worst-case conditions.

1.4.9 Air Quality

The existing air quality characteristics and conclusions for the Project Area remain accurate as described in SDEIS. In summary, the 100-MW Ball Hill Wind Project would produce zero annual emissions, while an existing upstate coal plant produces 243,767 tons per year of carbon dioxide in addition to other emissions. By prioritizing energy efficiency and renewable energy sources, such as the Ball Hill Wind Project, New York State can continue to improve air quality in the state and address the long-term impacts of climate change.

1.4.10 Communication Signal Study

In September 2016, Comsearch completed an *AM and FM Radio Report,* an *Off-Air TV Analysis*, a *Land Mobile & Emergency Services Report for Ball Hill Wind,* and a *Microwave Study* (see Appendix K, Communication Surveys) based on the updated Project Layout. The existing communication characteristics and conclusions for the Project Area remain generally accurate as described in the SDEIS.

Existing Conditions

Amplitude Modulation (AM)/Frequency Modulation (FM) Radio. Comsearch identified 12 FM radio transmitters in 2016 within the 30-km search radius, the same number it identified in 2015. Of these 12, only 10 are currently licensed and operating, four of which are translator stations that operate with a limited range (11 were licensed and operating in 2015). The stations are listed in Comsearch's report included in Appendix K, Communication Surveys. None of the FM stations are considered full-power stations (greater than 10 kW); four are medium-power stations (1 kW to 10 kW); five are low-power FM stations (100 watts [W] to 1 kW); and the remaining stations are all very low-power (less than 100 W).

Off-Air Television. Since the 2016 SDEIS, television coverage has changed slightly. As of 2016, there were 24 database records for stations. Of these 24, 16

are currently licensed and operating. Nine of the stations are full-power digital stations and are licensed under call signs WNYB, WBBZ-TV, WKBW-TV, WIVB-TV, WGRZ, WNYO-TV, WUTV, WNLO, and WNED-TV. There are seven low-power translators broadcasting that operate on a special transmit authority and operate with limited coverage.

Land Mobile Radio and Mobile Phones. In 2016, Comsearch identified 15 site-based licenses in and around the Project Area. Comsearch also identified 26 area-wide licenses for the state of New York and 11 for the county of Chautauqua. These area-wide licenses are designated for mobile use only. In 2016, nine cellular operating licenses were identified in the Project Area (seven were identified in 2012). For the list of land mobile radio (LMR) and mobile phone licenses, see Appendix K, Communication Surveys.

Microwaves. Comsearch's 2016 microwave study, based on the revised Project layout (see Appendix K, Communication Surveys), identified one microwave path intersecting the area of interest for the Project.

Impact Conclusions

Impacts from construction of the Project would not result in significant adverse impacts on communication signals in the Project Area, as stated in the SDEIS. Impacts to off-air television are similar to those described in the SDEIS. The full power digital stations (WNYB, WBBZ-TV, WKBW-TV, WIVB-TV, WGRZ, WNYO-TV, WUTV, WNLO, and WNED-TV) and Class A station WVTT-CD may have disruption in reception in and around the Project. The areas primarily affected would include TV service locations within 10 km of the Project and that have clear line-of-sight to a proposed wind turbine but not the respective station. Communities and homes located in these areas may have degraded reception of the following station: WNYB, Channel 26. This is due to the multipath interference caused by signal scattering as TV signals are reflected by the rotating wind turbine blade and mast.

According to the 2016 Comsearch Communication Signal Studies in Appendix K, Communication Surveys (as with the 2015 survey), there are 12 FM stations within 30 km of the center of the Project Area. All of the FM stations are located at distances greater than 9.01 km (5.59 miles) from the nearest turbine. At these distances, according to Comsearch, the wind turbine effects on the FM coverage for all of these stations would be very minimal to non-existent. No problems are expected for the coverage of the full-power and medium-power FM stations near the Project Area because the separation distances from the proposed wind turbines are so great. Audio signals from AM broadcast can interact with wind turbines at close range (1 to 3 kilometers [km; 0.62 to 1.86 miles]). However, the two AM transmitters (same station) identified by Comsearch were approximately 10 miles from the center of the Project Area.

The Fresnel Zones for the one microwave path identified were calculated and mapped in order to assess the potential impact from the turbines. None of the tur-

bines were found to have potential obstruction with the microwave systems in the area.

Mitigation

As stated in the SDEIS, the following mitigation measures will be implemented by Ball Hill:

- If there is a reported change in LMR coverage, the change can be easily corrected by repositioning the affected repeater, or by adding a repeater to the LMR system locations within the wind facility. Repeater antennas can be installed on utility, meteorological, or turbine towers in the wind facility, if needed.
- If a cellular system or personal communication system operator finds that their coverage has been compromised by the presence of wind turbines, coverage can be restored by adding an additional cell or an additional sector antenna to an existing cell. Submission of claims for signal interference by turbines will be accepted up to one year after tower commissioning, utilizing the complaint resolution procedure. The initial validity of claims will be evaluated by line-of-sight analysis of the communication tower, turbine tower, and receptor.
- After construction, Ball Hill will confirm and address on-site television reception interference issues on a case-by-case basis. Any complaints would be received by the environmental supervisor, who would follow a complaint resolution process to be developed in consultation with officials in the host communities and described Appendix L, Complaint Resolution Plan. Directional antennae or satellite television service may be offered as an alternative for those homes whose off-air television reception is found to be degraded.

1.4.11 Traffic and Transportation

An updated Transportation Site Survey is included in Appendix M, Transportation. Also included in Appendix M are summaries of turbine component, cement, and gravel truckloads, and a map of preliminary culvert locations and temporary roadway widening locations in the Project Area (for more detailed drawings of construction see Appendix C, Project Drawings).

The 2016 Transportation Study identifies two routes into the site from I-86:

- I-86 (from the east) to exit 12, SR 60 N - CR 50 N - US 62 N (through a left hand turn on US 62) - SR 83 N - CR 87 N - Danker Road (W) - Ball Hill Road (N) to the site; and
- I-86 (from the west) to exit 13 to make a U turn onto I-86 east to exit 12, SR 60 N -CR 50 N - US 62 N (through a left-hand turn on US 62) - SR 83 N - CR 87 N - Danker Road (W) - Ball Hill Road (N) to the site.

Alternate routes, including transporting loads in from US 20, are not an option. The corner at the northern end of Ball Hill Road in Forestville would be a difficult turn for a regular semi-truck, much less specialized wind heavy-haul equipment.

The Transportation Site Survey determined the Project should be successful in building and utilizing access roads on site to reach the identified turbine locations (see Appendix M, Transportation). No major transport obstacles or obstructions were identified that would prevent movement of equipment from origin points east or west of the Project Site while traveling on I-86.

A follow-up survey would be required once the Project approaches the transport execution phase and the following are confirmed or completed:

- Source locations defined;
- Lay-down yard or truck staging area;
- Pad access roads; and
- Road and pad completed to Vestas specifications.

It is estimated that 348 truckloads (12 truckloads per turbine) would be required to deliver turbine components to the Project Area (the 2008 study estimated between 410 and 500 truckloads). Approximately 1,392 truckloads of concrete would be required to complete the turbine foundations. The current estimate assumes concrete would be provided by a local batch plant. Each turbine foundation would require approximately 480 cubic yards of concrete, for a total of 13,920 cubic yards of concrete. Additionally, approximately 3,516 truckloads would be required to haul gravel to the site, which is based on the current estimate which assumes a total of 75,155 cubic yards of gravel for use on the Project Site, with 22 cubic yards transported per truck. The gravel would be used to build the Project's 13.0 miles of gravel roads. It is assumed that all gravel and cement loads would leave the Project Area empty.

As part of the Project approval process, Ball Hill will enter into road use agreements with the Towns that will require Ball Hill to perform pre-construction inspections of all roads that will be used for transportation and equipment delivery for the Project. The pre-construction inspection will result in a pre-construction survey report that will evaluate road features, such as embankments, guard rails, and culvert pipe conditions, and a detailed photographic survey of the Haul Route network immediately prior to construction. It will also identify utility lines that need to be raised to accommodate passage of the delivery vehicles and their loads.

The road use agreement will designate approved routes and commit the cost of both improvements and repairs to Ball Hill's account. General types of improvement and repairs may include repaving, patching, shoulder repair, and culvert repair. Ball Hill will have an obligation to perform any upgrades to the roadways and permanent structures that will be required to allow passage of the aforementioned loads, and will have an obligation to maintain the roads in a safe and pass-

able condition throughout the construction period. At the completion of construction, Ball Hill will return the roadways used for construction of the Project to preconstruction conditions.

Typically, intersection improvements include traffic sign removal, compacted gravel widening, drainage ditch filling, and/or drainage pipe culvert extensions. Once the gravel widening has been constructed, traffic signs will be reset to their original location on portable or removable posts so they can be easily moved when oversize loads pass through an intersection. When Project construction is complete, the intersections will be restored to their original condition and the disturbed areas will be reseeded as required.

With regard to air traffic, the FAA conducts its own review of radar obstruction when wind turbines are registered with them in the process of seeking a "Determination of No Hazard." As required, Ball Hill submitted a Notice of Proposed Construction to the FAA for review on November 23, 2015. During the review process, the FAA also circulates the application data to the U.S. Department of Defense and the DHS. The FAA responded to Ball Hill's application on August 11, 2016 with a "Determination of No Hazard to Air Navigation" for all the proposed turbine locations (see Appendix G, Agency Correspondence).

1.4.12 Land Use

Under the revised layout, the Project remains compatible with local and regional land use, as it would not preclude existing uses or interfere with proposed future uses outside of the established Project Site. Construction impacts would be temporary, short term and, for the most part, reversible. It is estimated that it would take about two years until temporary access roads and other construction-related land disturbances revert back to preconstruction conditions. Permanent impacts resulting from conversion of natural areas to built facilities and the conversion of one vegetative community to another would exist for the duration of Project operation(20 years) (i.e., impacts on forested lands), but it is expected that these converted areas could return to preconstruction conditions after decommissioning.

New land cover data from the United States Geological Survey has been released to the public. Figure A-3 and Table A-5 in Appendix A show the existing land use for the Project Area.

Figures A-4 and A-5 show setbacks established in accordance with Villenova and Hanover Town Laws. Table A-6 presents a summary of the construction and operation impacts of the Project on existing land use/land cover at the Project Site.

1.4.13 Socioeconomics

The existing socioeconomic characteristics and conclusions for the Project Area remain accurate as described in the SDEIS. Since the publication of the SDEIS, the Project has been reduced from 36 wind turbines to 29 turbines (23 in the town of Villenova and six in the town of Hanover) with a capacity to produce approximately 100 MW of electricity. The SDEIS provided a range of construction and

operational impacts based on a typical 79- to 100-MW wind project in the state of New York. Since Ball Hill chose to use 100-MW, the 100-MW turbine estimates shown in Tables 2.13-5 and 2.13-6 are applicable.

Construction Impacts

Regional economic output, a measure of economic activity in an area, is expected to directly increase by $5.6 million as a direct result of construction of the Project. An additional $58.0 million of economic output is expected to be generated as these funds are "multiplied" or cycle through the local economy. Construction of the Project would result in the direct employment of approximately 70 to 90 full-time equivalent (FTE) (with a total estimated payroll of $5.3 million).

Operational Impacts

During operation, the Project would inject an estimated $1.5 million annually into the regional economy via O&M expenditures at the site. These expenditures would occur annually for the life of the Project.

During operations, the Project would employ approximately 7-9 on-site FTE workers with a total estimated payroll of approximately $600,000, to operate and maintain the Project and to monitor production. Operation of the Project would also support an estimated 10 indirect and induced FTE jobs throughout the region (with a total estimated payroll of $3.0 million). The total direct, indirect, and induced impacts of operations of the Project would support approximately 16 FTE workers with a total annual payroll of approximately $1.3 million annually.

1.4.14 Cultural Resources

Panamerican Consultants, Inc. (Panamerican) has conducted the cultural resources investigations for the Project from 2008 until the present, which includes a Phase I Cultural Resources Study that has been updated at each stage of the Project based on the changes to the Project layout. The study involves archaeological excavations as well as analysis of historic architectural resources in accordance with the SHPO Guidelines for Wind Farm Development Cultural Resources Survey Work (SHPO 2006), NHPA, New York State Historic Preservation Act, SEQRA, the National Environmental Policy Act, as well as other relevant state and federal legislation. The methodology for the study was approved by the SHPO prior to commencement of the investigations. The archeological and architectural addendums for the Project were updated to reflect the FEIS layout and submitted to the SHPO for review (see Appendix G, Agency Correspondence).

Archaeological Resources

The purpose of the archaeological investigation was to identify all archaeological and cultural resources in the Project Area. The Project's area of potential effect (APE) has been revised from a 401-acre APE at the time of the DEIS, to 354.8 acres in the SDEIS, to a final area of 318.9 acres in this FEIS, based on the revisions made to the Project layout. The APE of the new design crosses similar environmental zones, "Local Habitat Areas," to those of the previously investigated APE. Therefore, the results generated by the first investigation are applicable in

assessing the archaeological sensitivity of the current APE. No potentially National Register of Historic Places (NRHP)-eligible archaeological cultural resources have been identified in the current Project Area.

The new Project design was reviewed over historic maps and only two map-documented structures (MDSs) were in the vicinity of APE that had not been surveyed. In consultation with SHPO, it was assessed that there is a low potential for the Project to affect archaeological deposits associated with these two MDSs given the inaccuracies of 19th century maps and additional archaeological testing for this Project was not necessary. Specifically, the SHPO agreed that the 2016 configuration of the Ball Hill Wind Farm Project is not sensitive for archaeological resources, and that sufficient field investigations have been conducted (Herter 2016; see Appendix G, Agency Correspondence). The full Archaeological Survey for the Ball Hill Wind Project, Addendum 3 is included in this FEIS in Appendix N, Cultural Resources Surveys.

Architectural Resources

The purpose of the 2016 architectural survey is to identify National Register Listed (NRL)/National Register Eligible (NRE) properties in the Project's 5-mile visual APE study area. Addendum #3 to the Architectural Survey (included in Appendix N) addresses newly identified areas in the current visual APE that were previously not covered by earlier investigations (i.e., new locations containing historic architectural resources now in the visual APE). It includes an up-to-date analysis of the potential visual effect of the Project on historic architectural resources in the study area.

National Register eligibility recommendations presented in the 2016 addendum report are preliminary and not considered final determinations of National Register eligibility. Final determinations will be made by SHPO.

Addendum No. 3 of the Architectural Survey for the Ball Hill Wind Project is attached to this FEIS in Appendix N. The following summary is presented in Addendum No. 3:

A total of 159 individual NRE properties and two NRE historic districts are in the current visual APE for the Ball Hill Wind Project (a decrease in five properties from the SDEIS). None of these properties are listed on the National Register. The average number of turbines that can be seen is 15 with an average distance of 3.6 miles. While some of these properties are grouped together within villages or hamlets, along roads or in associated complexes, such as farmsteads, on the whole, the properties are widely dispersed across the area. As noted in Section 3.0 of Addendum No. 3, the impacts to these resources vary with the surrounding topography, distance from the turbines and electrical lines, existing landscaping and vegetation, and surrounding land uses. Some screening would be afforded by mature trees, shrubs, and plantings for at least part of the year. This observation is especially true for buildings/structures in the areas surrounding streams and steep embankments. The topography of some portions of the 5-mile visual APE would

provide additional screening. Nevertheless, there are visual impacts to the area associated with the construction of the Project that will require mitigation.

Ball Hill is obligated to mitigate adverse visual effects to NRE and NRL properties under Section 106 of the NHPA as well as to mitigate significant visual impacts under Article 8 of the New York State ECL and 6 NYCRR Part 617 as delineated in the NYSDEC report entitled *Assessing and Mitigating Visual Impacts* (NYSDEC 2000). In the case of this Project, both Section 106 and NYSDEC mitigation were triggered by the same occurrence: the inclusion of NRE or potential NRE properties within the Project visual EPA. NYSDEC lists specific mitigation strategies while Section 106 does not; the two are not mutually exclusive, however the strategies for each can have common characteristics. Section 4.0, Mitigation of Visual Impacts of Addendum No. 3 (see Appendix N of this FEIS) summarizes mitigation types and techniques. In addition, Appendix O of this FEIS, Architectural Resources Mitigation, provides information about the kinds of visual impact mitigation strategies that may be pursued in consultation with SHPO, such as strategies pertaining to maintenance plans, various types of surveys, monetary contributions, heritage tourism materials or other educational activities. Ball Hill is committed to consulting SHPO on mitigation strategies for the Project and developing a Historic Resources Impacts Mitigation Plan approved by SHPO.

1.4.15 Health and Safety

The existing health and safety characteristics and general conclusions for the Project Area remain as described in the SDEIS. Appendix P, Health and Safety Plans, include Project specific versions of a Safety Program File, Emergency Response Plan (ERP), and Construction Quality Plan. The Ball Hill Quality Manual is also included. These files are identified collectively as Ball Hill's Health and Safety Plans. These documents are works-in-progress and subject to revision as more information becomes available. Ball Hill's final Project-specific Health and Safety Plans will be prepared and finalized prior to the start of construction, but will be maintained and continually updated throughout the life of the Project.

The Safety Program File is intended to provide guidance to those responsible for managing health and safety on project sites and will include copies of the local, state, and federal permits for the Project.

An ERP template was provided in the SDEIS. As stated in the SDEIS, Ball Hill will coordinate all fire protection and emergency response plans with local providers of such services. Ball Hill places the highest priority on safety and health procedures at its project sites, and will fully complete an ERP for the Ball Hill Project. Since publication of the SDEIS, a working draft for the ERP has been developed and is included in Appendix P, Health and Safety Plans. This plan includes Ball Hill's Emergency Notification Procedure, Spill Response Procedure, Site Evacuation Procedure, Fire Prevention Procedures, and Rescue Operations. The ERP is a living document that will be updated and improved upon as more information is available and as situations arise. These materials will be provided to all fire departments and emergency responders servicing the Project.

In March 2016, Ball Hill met with the following local fire officials from the fire districts serving the Project Area to provide an introduction to the Project:

- Silver Creek Volunteer Fire Department: Jim Tytka;
- Forestville Volunteer Fire Department: Kyle Barthel; and
- Hanover Hose Company: Steve D'Angelo.

The Construction Quality Plan describes in concise terms the specific means of implementing the Quality Management System, which is outlined in the Quality Manual in accordance with the contract documents relative to the Ball Hill Wind Project. The plan describes key personnel and responsibilities during construction of the Project.

The Lead Agency received several comments during the Public Hearing conducted for the Project Sponsor's amended Special Use Application on the potential for health effects from the Project on the local community including health effects from shadow flicker and noise (specifically "wind turbine syndrome" and infrasound).

The Massachusetts Department of Environmental Protection (MassDEP), in collaboration with the Massachusetts Department of Public Health (MDPH), convened a panel of independent experts to identify any documented or potential health impacts or risks that may be associated with exposure to wind turbines, and, specifically, to facilitate discussion of wind turbines and public health based on sound science (MassDEP and MDPH 2012).

During their evaluation, the Panel conducted an extensive literature review of the scientific literature as well as other reports, popular media, and the public comments received by the MassDEP and MDPH. In January 2012 the panel presented its finding on population responses to turbines and noise, vibration, and flicker.

The following are the findings with respect to infrasound (vibrations with frequencies below 20 Hertz [Hz]) and health impacts of noise and vibration:

- Infrasound from wind turbines is not related to nor does it cause a "continuous whooshing."
- There is insufficient evidence that the noise from wind turbines is directly (i.e., independent from an effect on annoyance or sleep) causing health problems or disease.
- Claims that infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically. Available evidence shows that the infrasound levels near wind turbines cannot impact the vestibular system.
- There is no evidence for a set of health effects, from exposure to wind turbines, that could be characterized as a "wind turbine syndrome."

- The strongest epidemiological study suggests that there is not an association between noise from wind turbines and measures of psychological distress or mental health problems. There were two smaller, weaker, studies: one did note an association, one did not. Therefore, the Project Sponsor concludes that the weight of the evidence suggests no association between noise from wind turbines and measures of psychological distress or mental health problems; and
- None of the limited epidemiological evidence reviewed suggests an association between noise from wind turbines and pain and stiffness, diabetes, high blood pressure, tinnitus, hearing impairment, cardiovascular disease, and headache/migraine.

In addition, the Chief Medical Officer of Health of Ontario Canada, prepared a report in response to public health concerns about wind turbines in May 2010 (Chief Medical Officer Of Health 2010), which concludes: "…that while some people living near wind turbines report symptoms such as dizziness, headaches, and sleep disturbance, the scientific evidence available to date does not demonstrate a direct causal link between wind turbine noise and adverse health effects. The sound level from wind turbines at common residential setbacks is not sufficient to cause hearing impairment or other direct health effects, although some people may find it annoying."

In addition, the Lead Agency received a comment during the public hearing for the SDEIS, concerning the impact of the shadow flicker on an individual with epilepsy. Modern, commercial-sized wind turbines do not cause flicker that is fast enough to cause epileptic seizures. Flicker frequency due to a turbine is on the order of the rotor frequency (i.e., 0.6 to 1.0 Hz), which is harmless to humans. According to the Epilepsy Foundation, only frequencies above 10 Hz are likely to cause epileptic seizures. This has been documented by the following resources:

- National Research Council. 2007. Environmental Impacts of Wind-Energy Projects. Washington, DC: The National Academies Press. Accessed online at: https://www.nap.edu/catalog/11935/environmental-impacts-ofwind- energy-projects; and
- Massachusetts Departments of Environmental Protection and Public Health. January 2012. Wind Turbine Health Impact Study: Report of Independent Expert Panel January 2012. Accessed online at: http://www.mass.gov/eea/docs/dep/energy/wind/turbine-impact-study.pdf

The complaint resolution procedure presented in this FEIS as Appendix L, will be approved by the Lead Agency, and provides mechanisms for filing and resolving complaints about noise and other matters.

1.4.16 Cumulative Impacts

Since the publication of the SDEIS, the proposed Cassadaga Wind Project has reduced the number of turbines from 62 to 58, and the project developer submit-

ted the Article 10 application to the New York State Board on Electric Generation Siting and the Environment. The developer of the Arkwright Summit Project is seeking permit approvals, and that project has not changed. The following summarizes the changes in cumulative impacts due to the updated Cassadaga Project and Ball Hill's revised layout.

Wildlife

Ball Hill has decreased impacts to forested areas from the SDEIS (from decreased number of turbines and length of transmission line) and Cassadaga has decreased the number of proposed turbines, while the general scope of the Arkwright Project has not changed. Therefore, the conclusion of the SDEIS remains valid, that the three wind power projects would be anticipated to result in minimal loss of habitat within the respective project areas as well as compared with available habitat within the region. In addition, the impacts on habitat are consistent with activities and conditions that regularly occur throughout the region as a result of normal farming and timber activities.

The analysis conducted for each of the three proposed projects concludes that forest habitat fragmentation caused by the projects would be minimal relative to the amount of fragmentation already present in the region due to existing infrastructure, and has been minimized in the siting process for wind farm turbines and facilities.

Avian and Bat Species

Construction-related activities at each project (e.g., clearing for road construction, infrastructure construction, equipment noise, and increased vehicle traffic) can potentially impact birds and bats by causing temporary displacement from habitat. Because these impacts are generally temporary and would be limited at any one location, potential cumulative construction impacts on bird and bat populations are not expected to be significant.

The potential cumulative impacts of the operation of the proposed Arkwright Summit project and the Cassadaga project were assessed in the SDEIS using the range of approximate fatality rates from post-construction studies conducted at New York State wind energy facilities. This analysis has now been updated and the revised tables are included as Table 1.4-1 and Table 1.4-2.

The species composition of estimated bird fatalities from turbine collision is primarily passerine species (approximately 60% of bird fatalities in the United States, with high percentages in the eastern United States) that occur at the highest rates during spring and fall migration (American Wind Wildlife Institute [AWWI] 2015). For most bird species, there is often only one individual killed at a site, suggesting that wind power projects do not have impacts at local or range-wide population levels for those species. Most of the fatalities resulting from a project would be of single individuals of one species, but the most common species would have fatalities of multiple individuals. Fatality rates at currently estimated values of avian mortality do not appear likely to lead to population declines in

most bird species (AWWI 2015), which is even more applicable for a cumulative evaluation of three proposed projects in Chautauqua County, New York.

Table 1.4-1 Approximate Regional Number of Bird Fatalities

Project	Number of Turbines	Number of Megawatts	Approximate Minimum Bird Fatalities/ Turbine/[1]	Approximate Minimum Bird Fatalities/ MW[2]	Approximate Maximum Bird Fatalities/ Turbine[3]	Approximate Maximum Bird Fatalities/ MW[4]
Ball Hill Wind	29	100	19	44	269	563
Arkwright Summit	36	79	24	35	334	445
Cassadaga Wind	58	126	38	55	539	709
Total	**123**	**305**	**81**	**134**	**1,142**	**1,717**

Notes:
1 0.66 birds/turbine/survey period (Jain et al. 2009). Survey Period Based on 2008 Noble Bliss three-day Survey Rate.
2 0.44 birds/MW/survey period (Jain et al. 2009). Survey Period Based on 2008 Noble Bliss three-day Survey Rate.
3 9.29 birds/turbine/survey period (Jain et al. 2007). Survey Period Based on 2006 Maple Ridge Daily Survey Rate.
4 5.63 birds/MW/survey period (Jain et al. 2007). Survey Period based on 2006 Maple Ridge Daily Survey Rate.

Table 1.4-2 Approximate Regional Number of Bat Fatalities

Project	Number of Turbines	Number of Megawatts	Approximate Minimum Bat Fatalities/ Turbine/[1]	Approximate Minimum Bat Fatalities/ MW/[2]	Approximate Maximum Bat Fatalities/ Turbine/[3]	Approximate Maximum Bat Fatalities/ MW/[4]
Ball Hill Wind	29	100	20	46	1,160	1,630
Arkwright Summit	36	79	25	36	1,440	1,288
Cassadaga Wind	58	126	41	58	2,320	2,054
Total	**123**	**305**	**86**	**140**	**4,920**	**4,972**

Notes:
1 0.7 bats/turbine/survey period (Stantec Consulting 2009). Survey Period Based on 2008 Munnsville Weekly Survey Rate.
2 0.46 bats/MW/survey period (Stantec Consulting 2009). Survey Period Based on 2008 Munnsville Weekly Survey Rate.
3 40 bats/turbine/survey period (Stantec Consulting 2011). Survey Period Based on 2009 Cohocton and Dutch Hill Daily Survey Rate. Note that this Project did not implement operational minimizations to reduce bat mortality that Ball Hill would employ.
4 16.3 bats/MW/survey period (Jain et al. 2011). Survey Period based on 2010 Noble Wethersfield Weekly Survey Rate. Note that this Project did not implement operational minimizations to reduce bat mortality that Ball Hill would employ.

Providing a context for the impact of the estimated regional bat mortality from local wind energy facilities in upstate New York (approximately 99 to 5,680 bats/year) on bat populations overall is challenging. The overall status of bat species populations is poorly known and the ecological impact of bat fatality levels is not known (AWWI 2015). Therefore, it is difficult to quantify population impacts on even a regional scale. The range of estimated bat fatalities shown in Table 1.4-2 is higher than would be expected for any of these projects because it is an-

ticipated that all three projects would implement various operational minimizations that would greatly reduce the number of bat fatalities as compared to older operating projects that do not employ similar methods. These collective minimization efforts would also reduce potential cumulative impacts to bats in the region.

Threatened and Endangered Species

Based on consultation with the USFWS, an IPaC search, and a revised Natural Heritage Program search, plus additional field surveys, as during the SDEIS, the only federally listed threatened or endangered species identified within the Project Area is the northern long-eared bat (NLEB). This species would be addressed through an operational curtailment approach designed to eliminate collision impacts, as well as through other features of a BBCS. Efforts at the other two projects are anticipated to be similar and thus no impacts are anticipated on the NLEB from these projects.

The Bald Eagle is another species that is present in all three project areas. Ball Hill is preparing an Eagle MP and it is anticipated that the other projects will need to address the minimization of potential eagle impacts in their permitting reviews in project-specific eagle management plans.

Bald Eagle nests within the vicinity of the Project Area are described in Section 2.6, Bird and Bat Resources, of this SDEIS. These same nests are in the general vicinity of the other three proposed wind projects, as well as several more nests to the south of the Cassadaga and Arkwright projects. The number of Bald Eagle nests has steadily increased over the last two decades in New York State and Chautauqua County and continued expansion is anticipated. No significant adverse impacts from Ball Hill construction activities on nesting Bald Eagles are anticipated given the distances to nests and adherence to the USFWS guidance (2007) for construction activities. The same adherence to USFWS guidance and level of impacts is anticipated for the Arkwright Summit and Cassadaga Wind projects, if they are constructed. Significant adverse impacts would not be anticipated from the operation of each project. Ball Hill will continue to coordinate with the USFWS regarding the potential risk to eagles from the Project. It is anticipated that there will be permit conditions from NYSDEC regarding monitoring for Bald Eagles and other listed species during Project operation and measures to avoid and minimize any potential impacts from operation. Arkwright Summit and the Cassadaga Wind Project are also coordinating with the USFWS and NYSDEC, and similar approaches are anticipated. As impacts to Bald Eagles have been low in the United States and each project is anticipated to conduct monitoring and coordinate with agencies regarding minimization measures, significant adverse cumulative impacts on the local nesting population are not expected from the operation of multiple wind projects.

Little use of these areas is anticipated by federally or state-listed endangered, threatened, and special concern species; therefore, the potential cumulative risk to

these species from both construction and operation of multiple projects is considered low.

Visual

The introduction of additional turbines within the same viewshed can increase the number of structures visible from affected vantage points, thus creating a potential higher density of visible structures. However, visibility of turbines depends on viewer location/orientation, distance, and other factors such as the topography and vegetation, the areas of the other wind projects, and the surrounding region. The farther one travels from a wind farm, the less visible it becomes. The dominance of a wind farm on a landscape would either be diminished to a distant background view as one travels farther from a wind farm or, in most cases, would not be visible at all. As such, cumulative impacts are considered only for those projects within a 20-mile radius from the Project Area. There are no existing wind farms within a 20-mile radius of the Project.

Saratoga Associates updated the VRA to reflect the revised Ball Hill layout. The VRA includes a cumulative impact analysis and is included as Appendix I, Visual Resource Assessment. Overall, given the reduction in the number of turbines at both Ball Hill and Cassadaga Wind, the cumulative visual impact would be less, relative to the analysis presented in the SDEIS.

Cumulative visual impacts from aviation safety lighting on turbines are anticipated in the same geographic areas as the viewshed for the Project. However, in accordance with FAA guidelines, not all turbines proposed for each project would have safety lighting. The cumulative impact is highly variable depending on the final number of turbines with lighting. Factors affecting visual impact may include the proximity of the turbines to the viewer, whether the viewer is stationary or moving, and the landscape setting. The lighting plan in the DEIS for Arkwright Summit proposed lights on 21 of the 44 turbines. Although a final lighting plan has not been completed for any of the projects at this time, it is expected that approximately one-half of the proposed turbines would have simultaneously flashing red lights. Thus, the cumulative lighting impacts would be minimal.

Sound

Because noise impacts are limited by the distance sound travels, no significant adverse cumulative impacts are expected with respect to noise. Any noise impacts resulting from construction of the projects would be considered localized and temporary. While the anticipated construction periods of the Project and Arkwright Summit could potentially overlap, given the distance of approximately 1.4 miles between the nearest points of the two projects, cumulative construction noise impacts are not expected. Operational noise impacts would be localized in the area of the proposed turbines at each wind power project.

Cultural Resources

The construction and operation of the Project would not have any significant adverse impacts on archaeological resources in the Project Area. Since there would

be no Project-specific impacts, there is no potential for contribution to cumulative archaeological impacts of the other proposed wind power projects in the region.

Construction of the Project would not have any direct impacts on architectural resources (i.e., demolition of any NRL-listed or NRE buildings) and no direct impacts have been identified in connection with Arkwright Summit or Cassadaga Wind. There is, however, a potential for construction of each of the proposed projects in the region to have visual and noise impacts on structures potentially eligible for the NRHP. Any such impacts would be temporary.

Operation of the three wind power projects would result in visual impacts on NRE and NRL properties within the region. As noted in Section 1.4.14, Ball Hill's archaeological and architectural resource consultants, Panamerican, identified 159 NRE properties and two NRE historic districts are in the current visual APE. Within the 5-mile APE for Arkwright Summit, a total of 288 properties that are listed in or determined eligible for the NRHP were identified (EDR 2015). In the 5-mile-radius study area for Cassadaga Wind there are two properties listed on the NRHP, 67 properties determined eligible for listing on the NRHP, and 15 properties whose NRHP eligibility is currently undetermined. One or more turbines may be visible from most of these structures. The visual impacts on these structures resulting from the operation of the other projects would be additive in the sense that more turbines are potentially visible from each property. The impact would vary depending on the number of turbines from each project that may be visible from a given property. The cumulative impacts on these resources would be reduced by a number of factors, including topography, distance from the turbines, existing landscaping and vegetation, and surrounding land uses. Mitigation would be required as a condition of the construction of each of the projects to offset these impacts and, thus, cumulative impacts as a result of these projects are not anticipated.

Land Use

Based on their proximity to each other, the Ball Hill, Arkwright Summit and Cassadaga Wind projects have the potential to contribute to cumulative land use impacts. Activities associated with the three projects would result in temporary and permanent impacts on land use, primarily conversion from one land use to another. Impacts would be greater during construction due to the need to build wider temporary access roads to support construction vehicles. Impacts would be reduced during operation when the width of these roads is reduced. For each project, locations of the turbines were chosen in part to minimize the loss of active agricultural land and interference with farm operations and other environmental resources.

Although, by their nature, each project would significantly change the appearance of the landscape, the projects are generally consistent with land use patterns within the region, and there is not expected to be a significant cumulative increase in the overall land use impact due to the operation of the projects. Land use in the region is described as rural-agricultural. The regional rural character is generally

defined by its wide open agricultural parcels and limited residential density. The projects are located entirely on private lands in areas dominated by active agricultural and forested lands, thereby avoiding significant adverse impacts on residential, commercial, and recreational land uses.

The proposed projects are compatible with agricultural land use, which dominates the region. Chautauqua County contains 235,858 acres of agricultural land, which represents approximately 35% of the county (U.S. Department of Agriculture [USDA] 2007; U.S. Census Bureau 2010). The total acreage of farmland that would be permanently impacted by conversion to nonagricultural uses for the Project and Arkwright Summit is approximately 82 acres (34.5 acres for the Project, 12.5 acres for Arkwright Summit, and 34.6 acres for the Cassadaga Wind Project). Thus, the cumulative loss of farmland would not significantly affect the total acreage of farmland in the region.

Compliance with local laws regulating the development of wind power facilities would ensure that cumulative impacts on land use are minimal. The Town Laws regulating wind energy facilities have specific agricultural mitigation measures based on NYSDAM guidelines, which include locating structures along field edges where possible, locating access roads along ridge tops, avoiding dividing large fields into smaller fields, and avoiding and maintaining all existing drainage and erosion-control structures. Compliance with these measures will limit adverse impacts on agricultural land use.

Transportation

Traffic volumes on the roads in the vicinity of the projects would increase during the construction of each project due to equipment and material deliveries.

No major or extended road closures or improvements are expected to be required to construct the projects. Minor intersection improvements would be required to accommodate the turning radii of oversize trucks. Because there is currently little or no congestion on the roads in the Project Area, it is expected that increased traffic volumes from the projects would result in minimal delays for local traffic.

Potential impacts during construction for each project could include damage to area roads and bridges. However, such potential damage would only be significant if the projects are constructed simultaneously and if the same haul routes are used. Roadway repairs as a result of damage incurred by Project construction activity would be coordinated through road use agreements with the towns and the county. The process of creating a road use agreement would allow the Towns' plans for scheduled paving and resurfacing to be coordinated with improvements and repairs by the wind power projects' developers.

If construction of either or both projects ultimately overlaps with construction of the Project, any cumulative impacts would be temporary and short-term. Based on current proposed haul routes, the haul routes for the proposed Arkwright Summit project and the Project would not overlap. The proposed haul route for

Arkwright Summit follows I-86 to Highway 60, to Highway 20, to Highway 39, to County Road 79. The proposed haul route for Ball Hill also follows I-86 to Highway 60 and then diverges from the Arkwright route: I-86 to Highway 60, to County Road 50, to US 62, to NY 83, to County Road 87, to Danker Road, to Ball Hill Road, to the site.

If delivery routes were to change during the design and construction preparation such that simultaneous hauling of equipment for both projects occurs in the area, Ball Hill and the other two projects would re-evaluate roadway conditions and make appropriate modifications. In the NYSDOT permitting process, a final route survey would be developed that identifies improvements necessary on state roads to accommodate delivery and construction vehicles when re-routing is impractical. These final plans are also coordinated with road-use agreements between the Towns and the County.

As previously stated, existing traffic within Chautauqua County is below road capacity and existing traffic conditions are light. A limited number of light trucks would occasionally access the facilities for service and maintenance; therefore, operation of the projects is not expected to have permanent impacts on local traffic and transportation.

Socioeconomics

None of the projects in the region are expected to adversely impact housing and population. It is likely that motels/hotels in larger population centers, such as Dunkirk-Fredonia, Jamestown, and Buffalo, would be able to absorb the temporary influx of construction workers to the area, even if the Project and the proposed Arkwright Summit project are constructed simultaneously. The hotels and motels would benefit from extended construction worker stays during the construction period of each project. These revenues would increase if considering the cumulative benefit of construction of multiple wind projects in the area. During construction of the projects, the local economy would experience several significant cumulative benefits from construction, including an increase in local economic activity and purchases of automotive fuel, meals, and other items.

The sales data collected in existing wind farm markets indicate that the construction and operation of wind power projects has no influence on property values (see Appendix Q, Property Valuation Study). Furthermore, the projects would have a positive long-term cumulative impact on the local economy in the form of payments in lieu of taxes to local municipalities, license agreements with host communities, and lease revenues to participating landowners.

Mitigation of Wind Project Cumulative Impacts

The cumulative impacts of constructing and operating the Project and other wind generating facilities in the region are, on balance, either positive or of limited significance and, therefore, do not require mitigation. This is particularly true with the economic benefits to host communities when payments in lieu of taxes and Host Community Agreements are considered. Additionally, the Project, as pro-

posed in this FEIS, has reduced the number of turbines, length of overhead line, and overall Project footprint from the 2016 SDEIS, thereby reducing the cumulative impact on environmental resources. Ball Hill will review the potential for cumulative cultural impacts with the SHPO to develop a Memorandum of Agreement, if necessary. Ball Hill will continue to coordinate with NYSDEC and the USFWS regarding wildlife impacts and it is anticipated that the other project sponsors will do the same.

1.5 Additional Project Components

This section identifies additional Project plans and studies either specifically requested by the Lead Agency or required under SEQRA.

1.5.1 Decommissioning Plan

The Town of Villenova Local Law No. 1 of 2007, entitled the "Wind Energy Facilities Law," and Article XVI of the Hanover Zoning Law, entitled "Wind Energy Conversion Systems," require that a decommissioning plan be prepared prior to issuance of a wind energy permit or special use permit. The decommissioning plan facilitates removal of any turbine and associated Ball Hill-owned facilities at the end of a turbine's useful economic life. A decommissioning plan was prepared and accepted as part of the 2008 DEIS and has since been updated in the FEIS (see Appendix R, Decommissioning Plan). The Decommissioning Plan reflects current costs and numbers associated with decommissioning activities.

The expected useful life of the Project components is 25 to 30 years, although it is reasonable to expect that this life can and would be extended by proper maintenance (the SDEIS only predicted 20 years). Decommissioning work would be performed in accordance with all federal, state, and local requirements and the appropriate permits will be obtained prior to conducting any decommissioning activities. The decommissioning plan for the Project includes detailed descriptions and cost estimates for the removal of all turbine components. The decommissioning plan provides that the site would be restored, including removal of aboveground structures (i.e., wind turbine removal, pad mount removal, and overhead collection line removal) and underground features to a depth of 3 to 4 feet (see Appendix R, Decommissioning Plan).

Detailed costs of decommissioning Project components, average salvage values for various components, and a net decommissioning cost per turbine are presented in the updated decommissioning plan. The total cost of decommissioning is estimated at $17,600 per turbine, or $509,000 for the 29 turbines, which includes blades/hub removal, nacelle removal, tower dismantling, foundation removal, and backfill/restoration. Additionally, the plan estimates decommissioning of the collection line, substations, and roads to cost $149,000. In total, decommissioning is estimated to cost $658,000, an average of $22,700 per WECS.

In accordance with the Town of Villenova Wind Law, Ball Hill will establish financial security in a form and amount acceptable to the Town. Ball Hill will review and revise all estimated decommissioning costs on or before each five-year

anniversary of the Project's first date of commercial operations, and notify the Town of Villenova of any changes. The details of the timing and nature of the updated calculations will be included in the Host Community Agreement between Ball Hill and the Town.

1.5.2 Environmental Monitoring Plan

Construction activities would be monitored by Ball Hill to ensure compliance with applicable permit conditions, the SWPPP, and BMPs. The purpose of the EMP is to provide the environmental supervisor(s) with a reference source to aid in managing the environmental issues that may be encountered during construction of the Project. Environmental impacts may occur during the many phases of Project construction including roads, foundations, erosion control devices, electrical collection and transmission lines and equipment, electrical substation and switchyard, and erection of turbine equipment. Ball Hill' Environmental Monitoring Plan (titled "Construction Environmental Plan", contains the framework for the daily and long-term monitoring and reporting structure to ensure that the Project is completed within the parameters set forth in the permits issued for the Project. The EMP is intended to be a "living" document, which would evolve as the Project progresses and/or as unanticipated issues arise. The EMP for this Project is included as Appendix S.

1.5.3 Property Valuation Study

The updated property valuation study for the Project is included as Appendix Q. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no basis for concluding there would be any impact or potential impact on residential real estate values in the market area analyzed due to being in proximity or in the viewshed of an operational wind farm. The study indicates that this conclusion comports with the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there would be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that these facilities have had no broad-based effects on property values in those markets.

1.5.4 Materials Safety Data Sheets

All materials used during the inspection and maintenance of Project equipment will follow a strict MSDS program and, when required, will include documented, dedicated control of excess materials as well as off-site disposal of waste materials at licensed facilities, with an emphasis on recycling whenever possible. Typical MSDSs are included in the FEIS as Appendix D.

1.5.5 Complaint Resolution Process

A Complaint Resolution Plan that describes the process for receiving and addressing complaints during construction and operation of the Project, as developed in cooperation with the Towns, is presented in Appendix L. The complaint resolution procedure as presented to the Lead Agency and Town of Hanover Town

Board and in the Project Amended Applications, will provide a mechanism for filing and resolving complaints about noise and other matters.

Attached to the complaint resolution plan are instructions on how to report a complaint during construction or operation of the Project, as well as Ball Hill policies and procedures with respect to complaint monitoring and reporting.

1.5.6 Agency Correspondence

Since the SDEIS was submitted in January 2016, Ball Hill has consulted with SHPO, the NYSDEC, and the FAA. Additionally, a new USFWS IPaC search was conducted, as referenced above in Section 1.4.5. Agency correspondence documents are included in Appendix G.

State Historic Preservation Office

Ball Hill is currently in the process of consulting with SHPO on new reports.

Archaeological Resources. SHPO concurs that no additional Phase IB archaeological survey is warranted given that the APE has been reduced by 46.2 acres and the low archaeological sensitivity of the 2015 Ball Hill Wind Project configuration.

Architectural Resources. SHPO notes that the following properties inventoried in 2008 and 2013 studies were eliminated from the inventory of National Register-eligible resources located within the visual APE in the 2015 study. Some of these omissions were due to mapping and National Register status errors in SHPO's new online database, the Cultural Resources Inventory System (CRIS). SHPO updated CRIS to correct these errors, and requested that the Architectural Survey report, Addendum No. 2 be revised to include the following:

- The Silver Creek Historic District (USN 01346.000242), identified as NRE in correspondence from this office dated September 30, 2013, has been tagged as eligible in CRIS.
- The Center Street Historic District in Forestville (USN 01352.000127), identified as NRE in correspondence from this office dated September 30, 2013, has been tagged as eligible in CRIS.
- The Ewing Park South Dayton Historic District (USN 00954.000062), identified as NRE in correspondence from this office dated September 24, 2008, has been tagged as eligible in CRIS.
- Weaver Cemetery in Arkwright (USN 00926.000044) was not removed from CRIS at any time, and is now plotted on the CRIS map.
- Ewing Park in South Dayton (USN 00954.000043) is now identified as contributing to the NREe Ewing Park South Dayton Historic District; also, please note that USN 00954.000012 (the E.B. Crissey & Co. building at 30 Maple Street) was incorrectly tagged in CRIS as not NRE, but it is eligible as a contributing property in the Ewing Park South Dayton Historic District.

- St. Peter's Episcopal Church in Forestville (USN 01352.000002) was not removed from CRIS at any time, and was determined NRE on September 5, 2013; it is now plotted on the CRIS map.

Ball Hill is currently revising the architectural survey report and continuing consultation with SHPO.

New York State Department of Environmental Conservation

Ball Hill requested an updated New York Natural Heritage Program database review for the Project Area on August 11, 2016, since more than a year had lapsed since the previous consultation. NYSDEC responded on September 21, 2016, with a report of rare or state-listed animals and plants, and significant natural communities that the database indicates occur on the Project Site or in its immediate vicinity. Also enclosed was a report of rare bats documented within 40 miles (the 2015 consultation did not include this) and rare birds documented within 10 miles of the Project Site.

The NYSDEC identified bald eagles within 0.6 miles of the Project Site (in 2015, it identified bald eagles within 0.3 miles). Rich hemlock-hardwood peat swamp, shrub swamp, and butterwort were also identified, as with the 2015 consultation. The northern long-eared bat, a federal and New York State-listed threatened species, was identified within 40 miles of the Project Site. The 2015 consultation did not include the northern long-eared bat since its summer locations were not yet entered into the NYSDEC's database. The same list of seven birds within 10 miles of the Project Site was included in the 2016 consultation as with the 2015 consultation, although the Great Blue Heron was identified as having a "significant breeding colony" in 2016 (it was listed as "breeding" in 2015).

Federal Aviation Administration

The FAA conducts its own review of radar obstruction when wind turbines are registered with them in the process of seeking a "Determination of No Hazard." As required, Ball Hill submitted a Notice of Proposed Construction to the FAA for review on November 23,2015. During the review process, the FAA also circulates the application data to the U.S. Department of Defense and the DHS. The FAA responded to Ball Hill's application on August 11, 2016 with a "Determination of No Hazard to Air Navigation" for the proposed turbines (see Appendix G, Agency Correspondence).

2 Response to Public Comments

This section provides a summary of the substantive public comments received regarding the Project since the publication of the 2008 DEIS. As noted in Section 1.2, in September 2008 the Town Board, as the Lead Agency under SEQRA, accepted the 2008 DEIS commencing a public comment period.

Since the commencement of the public comment period in fall 2008, the following opportunities were provided to the public to provide substantive comments on the Project:

- Written comments were received through January 26, 2009 on the 2008 DEIS;
- Verbal comments were received at a public hearing on the 2008 DEIS on October 30, 2008;
- Written comments were received between January 18 and March 14, 2016, on the 2016 SDEIS;
- Verbal comments were received at a public hearing on the 2016 SDEIS on March 2, 2016;
- Verbal comments were received at a public hearing on the 2016 amended application to the Town of Villenova on October 13, 2016;
- Written comments were received for 10 days after the public hearing on the 2016 amended application to the Town of Villenova;
- Verbal comments were received at a public hearing on the 2016 amended application to the Town of Hanover on November 9, 2016; and
- Written comments were received for 10 days after the public hearing on the 2016 amended application to the Town of Hanover.

Comment statements received during these open public comment periods as well as notices of the public hearings and commencement of open comment periods are included in this FEIS as Appendix T, Public Participation.

For the purposes of this FEIS, comment statements are considered to be the venue for which comments were received (i.e., a letter, e-mail, or verbal testimony at a public hearing). Within each comment statement there can be multiple comments. Comments from members of the public and state agencies are summarized within each public comment period (2008 DEIS, 2016 SDEIS, Public Hearing on the

Amended Application in the Town of Villenova on October 13, 2016 and Public Hearing on the Amended Application in the Town of Hanover on November 9,2016) below. Sections 2.1 through 2.3 provide general information on the public comment periods and the comments received on the Project. In addition, pursuant to their obligations under SEQRA, Ball Hill has provided direct responses to all comments received on the Project during public comment periods from 2008 through the publication of this FEIS (see Section 2.4). Comments are compiled in the following sections by topic area.

2.1 Comments on the 2008 DEIS

The Town of Villenova, as the Lead Agency, accepted the 2008 DEIS as complete and initiated a public comment period on the 2008 DEIS which extended until January 26, 2009. During this time, Noble received five individual comment statements on the Project as well as 10 verbal commenters at the October 30, 2008, 2008 DEIS public hearing. Commenters included NYSDEC, NYSDAM, NYSPSC, and concerned citizens. To the maximum extent practicable, Ball Hill took into consideration the comments on the 2008 DEIS while preparing the 2016 SDEIS.

Ball Hill reviewed the 6 comment statements received and identified 135 individual comments within those statements that were then considered in development of the 2016 SDEIS. Due to the updated Project layout and turbine technology shifts, the majority of these comments are no longer applicable; however, Ball Hill has directly responded to all comments received on the 2008 DEIS in Section 2.4. In addition, all of the abovementioned commenters were given the opportunity to comment on the 2016 SDEIS during the open public comment period from January 18, 2016, through March 14, 2016. Comments are categorized in Section 2.4 by resource area addressed in the FEIS. Some of the comments received covered more than one resource area; as a result, the total 2008 DEIS comment responses below do not add up to 135 (174 comments by resource area). Of the 174 comments by resource area, 47 were in relation to Project Description and Design, 24 to Water Quality and Wetlands, five to Biological Resources, 12 to Bird and Bat Resources, 16 to Visual Resources, 10 to Sound, 21 to Socioeconomics, two to Communication Surveys, 12 to Safety, five to Decommissioning, six to Public Participation13 to Soils, and one to cultural resources.

The comment statements received during the 2008 DEIS including the public hearing transcript are included in this FEIS in Appendix T, Public Participation.

2.2 Comments on the 2016 SDEIS

The Town of Villenova, as the Lead Agency, accepted the 2016 SDEIS with updated turbine technology and layout, as complete and initiated a public comment period on the 2016 SDEIS from January 18, 2016, through March 14, 2016. The public comment period for the SDEIS was open from January 18, 2016, through March 14, 2016. During this time, the NYSPSC wrote two comment letters, the NYSDEC submitted a comment statement, 11 concerned citizens provided written comment statements and 16 concerned citizens spoke at the public hearing on

March 2, 2016. Ball Hill responded directly to the NYSPSC letter with a response letter dated November 16, 2016. A copy of this letter is included in full in Appendix G, Agency Correspondence. Ball Hill's responses the comments received in the NYSPSC comment statements are summarized below.

Ball Hill reviewed all 15 comment statements and narratives received and identified 236 individual comments within those statements and addressed them in this FEIS in Section 2.4. Comments are summarized below and categorized by resource area addressed in the FEIS. Some of these comments received covered more than one resource area; as a result, the total below does not add up to 236 (238comments by resource area. Section 2.4, Response to Comments on the SDEIS, provides direct responses to all of the comments received during the public comment period on the SDEIS.

Copies of the comment statements received during this time are included in Appendix T, Public Participation.

Project Description and Design

Fifty-two comments were received on overall Project design including, but not limited to, the type of turbine selected; location of Project facilities; construction details; and questions on Ball Hill procedure, policy, and other projects. Comments generally in favor of the Project are also included here.

Bird and Bat Resources

Thirty-eight commenters, both concerned citizens and agencies, were concerned with the Project's impact on bird and bat resources in the Project Area. Concerns included direct harm to the resources as well as indirect habitat infringement and impacts that would put pressure on the birds and bats in the area.

Socioeconomics

Comments, with respect to socioeconomics, included concerns with decreasing property values due to the Project. In addition, commenters were concerned with lease and Host Community Agreements with the Town and where and how the money may be spent. A total of 31 comments were received on socioeconomic resources.

Biological Resources

Thirty comments were received in relation to impacts on wildlife and forested areas including habitat fragmentation. Additionally, multiple comments were received in relation to environmental monitoring during construction and operation of the Project including invasive species management and permit conditions.

Public Participation

Some commenters were concerned with the notices for the public hearings and the ease of access of the public documents for review. Additional comments were received regarding the regulatory process of the Environmental Impact Statement. A total of 25 comments were received on public participation.

Water Quality and Wetlands

Twenty-three comments were received relating to, but not limited to, the Project's impacts on wetlands and streams specifically including impacts on wetlands falling under NYSDEC purview. Multiple commenters were concerned with the incomplete field work for the Project Area.

Sound

Twenty-one comments were concerned with sound from the turbines as well as the substation, the Project meeting Town requirements, and low-frequency sound from the Project.

Visual Resources

Nineteen comments expressed concern with the overall look of the landscape from the construction of the Project as well as potential impact on households from shadow flicker.

Safety

Commenters were concerned with Ball Hill's commitment to health and safety on the Project Site as well as safety concerns from other wind Projects across the country. A total of nine comments were received on health and safety.

Decommissioning

Commenters were concerned with Ball Hill's commitment to decommissioning the Project and the proposed Decommissioning Plan. A total of six comments were received on decommissioning.

Cumulative Impacts

Ball Hill was asked to update the cumulative impact analysis based on new available information on neighboring wind projects as well as for the new layout of this Project. A total of four comments were received on cumulative impacts.

Transportation

The number of trucks for construction of both the turbines and the construction materials were of concern to the Town of Villenova Highway Superintendent. Comments also included questions on agreements between the Town and Ball Hill for road use and improvements. Three comments were received on transportation.

Land Use

One commenter was concerned with the Project effect on land use in the Project Area.

Communication Surveys

One commenter commented on the effect of wind turbines on the local weather stations.

2.3 Comments on the 2016 Amended Applications to the Towns

During the public hearings for the 2016 amended applications to the Town of Villenova (October 13, 2016) and Town of Hanover (November 9, 2016), 49 citizens (22 at the Town of Villenova hearing and 27 at the Town of Hanover hearing) voiced comments and questions about the Project. The majority of these comments were directly answered at the public hearings by the Ball Hill Project team.

Many topics were discussed at the public hearings, including, but not limited to, general support for the Project; concerns and questions about financing of the Project and payments to the Town and leaseholders; concerns about the public's participation, availability of resources, and representation by the Town Boards; concerns over the environmental impacts of the Project including visual resources, impacts on wildlife; concerns and support for how the payments from Ball Hill to the Town would be utilized; concerns about utilizing local employees for the construction of the Project; questions about the Project facilities including the turbines and the transmission line; the potential for interference with flight paths and communications; decommissioning of Project facilities; transportation impacts; and potential sound impacts. Ball Hill and/or the Towns' attorney directly answered all comments set forth at the Town of Villenova public hearing on October 13, 2016. At the Town of Hanover on November 9, 2016, the majority of comments were directly addressed; however, four topics required additional information to be provided in the FEIS:

- Infrasound: There was concern expressed at the meeting with respect to a study by Central Michigan University that states that emissions of infrasound, sound that is not normally heard by most human listeners, and low frequency noise by industrial wind turbines has an adverse health effect on humans. Section 1.4.15 of this FEIS describes infrasound with respect to this Project.
- Auditory processing: A commenter expressed concern over a child with Auditory Processing Disorder and the low frequency sound of the turbines. The closest turbine from the address identified by the commenter is approximately 4,000 feet away. The highest predicted sound level at her house from all wind turbines operating at their highest sound levels is 36 dBA: 33 dBA of this total is from the nearest turbine; the other 3 dBA is from the other turbines combined. Under these conditions, the existing background measurements done by Hessler Associates in 2008 show sound levels at 34 dBA. These are at the L90 sound level, which is the quietest background. In other words, 90% of the time, sound in the community today is higher than 34 dBA under conditions that will produce 36 dBA in the future from the turbines. Combining 34 dBA and 36 dBA yields 38 dBA or a 4 dBA increase, which is well within the NYSDEC Policy of 6 dBA or less. It was suggested to the commenter that she discuss the matter with her child's physician, but in the experience of Ball Hill this minimal sound impact is not associated with negative impacts on human health.

- National Oceanic and Atmospheric Administration Radar: As also noted in response SDEIS-0015-48 in Table 2.4-1, the operation of commercial wind turbines can be interpreted as weather events on Doppler radar. While it is not known whether the Ball Hill wind turbines will show up on Doppler radar, radar technicians can take note of their presence and readily interpret them as non-weather phenomena.
- Unregulated airstrips: A commenter mentioned a location of an airstrip and identified concern of the turbines affect planes making approaches. As stated at the hearing, Ball Hill adhered to the required permitting through the FAA and received determinations of no hazard from the FAA. Ball Hill also met with the local airport in Dunkirk and sited all turbines more than six nautical miles from the airport per the airport's request. Ball Hill cannot be held responsible for the use of non-registered airstrips, but invited the commenter to provide the property address to better understand and respond to the comment.

A copy of each public hearing transcript is attached to this FEIS in Appendix T, Public Participation.

After each public hearing, a 10-day public comment period remained open for concerned citizens to submit comments to the Town for inclusion in the FEIS. Seven written comment statements were received by the Town of Villenova after the October 13, 2016, meeting and no written comments were provided to Ball Hill during the 10-day period after the Town of Hanover Public Hearing on November 9, 2016. The official notice of public hearing, transcripts, and written comments received for the Amended Application for both Towns are included in this FEIS in Appendix T, Public Participation

The seven written comment statements received by the Town of Villenova after the October 13, 2016, meeting highlighted a variety of topics of concern, including visual and shadow flicker impacts, wildlife and birds, traffic and transportation, drinking water quality, economic benefit to the Town, setback concerns, property value, Project economics, and health effects from wind turbine syndrome and infrasound. This FEIS along with the 2016 SDEIS analyzes the impacts with respect to these concerns in the following sections:

- Visual and shadow flicker impacts: Section 2.7 and Appendix M of the 2016 SDEIS; updated analysis in Section 1.4.7 and Appendix I of this FEIS;
- Wildlife and bird impacts: Sections 2.5 and 2.6 and Appendices K and L of the 2016 SDEIS; updated analysis in Section 1.4.5 and 1.4.6 and Appendix H of this FEIS;
- Traffic and transportation: Section 2.11 and Appendix D of the 2016 SDEIS; updated analysis in Section 1.4.11 and Appendix M of this FEIS;
- Drinking water quality: Section 2.3 of the 2016 SDEIS and Section 1.4.3 and Appendix E of this FEIS;

- Economic benefit to the Town: Section 2.13 of the 2016 SDEIS and Section 1.4.13 of this FEIS;
- Setback concerns are included in the siting of the Project and are described in detail in Section 1.3 of this FEIS. The Project is in compliance with local setback laws and in addition, Ball Hill's policy is to site turbines beyond the minimum setback to distances of at least 500 meters (1,642 feet) from existing residences, whenever practicable.
- Property value: A property valuation study is included in this FEIS as Appendix Q;
- Project economics: Ball Hill is the Project Sponsor and engaged in a detailed process of micrositing and analyzing engineering options and controls in order to minimize or avoid Project environmental impacts identified in the January 2016 SDEIS. The current layout reflects a balance of minimizing potentially negative environmental and human impacts while still providing an economically viable Project to produce energy from 100 MW of wind capacity to the electric grid; and
- Heath effects in relation to wind turbine syndrome and infrasound are discussed in the FEIS is Section 1.4.15; Health and Safety.

2.4 Response to Comments on the SDEIS

This FEIS includes copies of all public comments received during the public comment periods on the 2016 SDEIS and 2008 DEIS and Ball Hill's responses to them. The comments and responses are organized by topic and presented in Tables 2.4-1 and 2.4-2. Within the tables the agency comments are presented first, followed by written comments from concerned citizens in order of receipt, followed by the public hearing transcript. The topics are ordered by number of comments received with the topic receiving the most comments presented first. Each comment statement is given an identification number (i.e., SDEIS-0001 or DEIS-0001) and each comment within that statement is given a unique code (e.g., SDEIS-0001-1 and SDEIS-0001-2). These are given to comments in the order they are stated in the comment statement.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Project Description and Design			
SDEIS-0001-1	Public Service Commission	The SDEIS describes one significant change in the project transmission line: the prior project included a 6-mile long transmission line rated at 115 kV, whereas the SDEIS describes a 6-mile long 230 kV transmission facility (SDEIS, pg. 1-8). As indicated in the SDEIS, this increase in design capacity makes the transmission facility subject to the jurisdiction of the New York State Public Service Commission (NYSPSC or PSC) under article VII of the Public Service Law (PSL) at §120, et. seq. Article VII supplants other procedural permits and approvals otherwise applicable to the major transmission facility including the 230 kV transmission line, and associated substation and switchyard components. While the identification of potential environmental impacts associated with the transmission facility as a part of the overall review of the "Ball Hill Wind Project" including cumulative impacts is appropriate in the EIS record, the EIS should acknowledge that Article VII reviews are classified as "Type 11 actions" in the SEQRA regulations, and thus are not otherwise subject to SEQRA procedural provisions (6 NYCRR 617.5(c)(35).	Since submitting the SDEIS for this Project Ball Hill has elected to revert to the original 115-kv design of its transmission facility. As currently proposed, the approximately 5.7-mile-long transmission line would follow the same route as the 230-kv line described in the SDEIS. As a 115-kv facility less than 10 miles in length, the currently proposed transmission line would not be subject to Article VII jurisdiction.
SDEIS-0001-2	Public Service Commission	PSL Article VII essentially supplants other state and local permitting requirements and approvals of a procedural nature (PSL §130) for major transmission facilities, so certain statements in the SDEIS should be modified in the FEIS. For example, Section 2.4.3, under "Minimization of Impacts during Construction and Operation of the Project" the "NYSPSC" should be added to the statements "Ball Hill will follow all NYSDEC and USACE permit requirements regarding restoration of wetland impacts" and "An invasive Species Management Plan (ISMP) will be fully developed in consultation with NYSDEC and USACE" (SDEIS, pg. 2.4-15). Likewise, the New York State Department of Public Service staff (Staff) should be referenced at discussion of the Mitigation for Permanent [Wetland] Impacts (SDEIS pp. 2.4-16 and -17).	Please see response to SDEIS-0001-1, above.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0001-4	Public Service Commission	At page 1-17, the SDEIS states that "underground collection lines would be installed via trenching or using a directional bore at stream locations. Streams that are not normally dry at the time of crossing would be temporarily dammed, and water would be pumped around the construction area to allow collection lines to be installed in dry conditions. The equipment that would be used to install the collection lines cuts a trench, places the cable, and backfills the trench in a single pass, thereby reducing the duration of stream disturbance. If directional boring machine is used, a horizontal boring machine will install a bore sufficiently below the bed, and cables will be pulled back in the bore." DPS recommends that trenching machines not cross significantly classed streams (including classes C(T) and above and any intermediate waterbodies greater than 10 feet). Instead, during dam and pump around or similar installation methods, proper erosion control devices should be placed along the stream bank; the trench can then be excavated from either side of the control measures.	As discussed in Section 1.3.3 of this FEIS, underground collection lines would be installed via trenching or using a directional bore at stream crossings. Boring (and not dam and pump methods) will occur for stream crossings where required by permit condition or where specific site conditions (e.g. protected streams, steep slopes, unstable soils or other engineering challenges) necessitate its use." If directional bore is used, a horizontal boring machine will install a bore sufficiently below the bed, and cables will be pulled back in the bore. Each bore will start and finish beyond stream banks. Aboveground junction boxes will be located at various locations to join multiple reels of cables for long runs and at one end of each directional bore location.
SDEIS-0001-5	Public Service Commission	The SDEIS indicates on page 1-12 that there will be construction of an approximately 6 mile long overhead 230 kV transmission line which will transfer the energy produced by the Project from the new substation to the new switchyard. The switchyard would be constructed in the Town of Hanover. This switchyard would provide a connection to an existing 230-kV National Grid overhead transmission line. It would appear that there would be a potential for reduction in environmental impact (including reduction in forest clearing, land use, visual exposure, etc.) if the new collection substation were to be constructed north of its currently proposed location. By placing the substation in a more northerly location, the length of the overhead transmission facility and ROW area would be reduced. The FEIS should explain whether any alternative locations for the collection substation were explored, whether any reasonable alternatives were identified, and provide a comparison of potential impacts.	Since receipt of this comment, the proposed new collection substation has been moved to the north of its earlier proposed location. This open field location also satisfies landowner preferences.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0001-6	Public Service Commission	Page 1-15 of the SDEIS notes that "this area (staging area) could be used as short term staging for verification of match marking, a quality receipt inspection, washing, and any necessary rigging adjustments prior to site delivery. Please provide an explanation of the term "match-marking."	Matchmarking is the process of marking equipment components so they can be assembled in the correct manner.
SDEIS-0001-7	Public Service Commission	Page 3-5 of the SDEIS notes that "if overhead collection lines were to be required in future site design, it would reduce wetland impacts or be placed due to topography constraints. The transformers are interconnected through a collection system consisting of both underground and above ground power lines on wooden poles that will connect all of the turbines together electrically ... The majority of the collection system, as currently designed, will be installed underground ... As currently planned, the collection system is entirely underground in compliance with the Town's local law requirements. Accordingly, overhead collection lines will only be used if necessary in a few select areas to avoid drainage and wetland features or other areas where burial of collection lines is problematic from an engineering standpoint as contemplated by the towns." If available, provide a map with the potential collection line locations that may be installed overhead; an accompanying explanation would also be beneficial. Also, if available, provide the required clearing ROW width for installation of overhead collection lines.	No overhead collection line circuits are currently proposed for the Project.
SDEIS-0001-8	Public Service Commission	Without repeating prior comments on the DEIS regarding potential impacts of the proposed transmission line, DPS remains concerned that the proposed location and design of the 230 kV line involves clearing and access road development on steep slopes and construction of transmission structures close to protected streams. The SDEIS does not provide any updated Transmission Line Plan and Profile drawings reflecting the upgrade of design from 115 kV to 230 kV (DEIS Drawings BH-T-301 Sheets 1 through 6 were for a 115 kV facility). Final facility design and location will be subject to the NYS PSC review pursuant to PSL Article VII.	As mentioned previously, the concerns of the NYSPSC have been reviewed and the proposed transmission line would be 115 kV, not 230 kV. Its constructability has been reviewed by RES engineers. Typical transmission line plan and profile drawings are included in Appendix C, Project Drawings in this FEIS. Further analysis of the potential environmental impacts of the proposed 115kv line are presented in the FEIS in Section 1.4.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0001-14	Public Service Commission	OTHER PERMITS AND APPROVALS The FEIS should acknowledge the appropriate jurisdictional role of the NYS PSC in the overall Ball Hill Wind Project development, siting and permitting program. In addition to the Article VII jurisdiction described above, the Wind Project will be subject to PSL §68(1) authority as an Electric Corporation if the final design exceeds 80 MW, as previously described in DPS correspondence to the Lead Agency from June 18, 2008, and November 10, 2008. If the final design will exceed 80 MW, the attached list of standard information requests regarding Wind Energy Project subject to PSL §68 CPCN Review should be addressed in a Petition for Issuance of a Certificate of Public Convenience and Necessity. To the extent that any of these questions relate to environmental findings, they should be addressed in the FEIS.	See response to comment ID SDEIS-0001-1, above. Ball Hill will be submitting a petition to the NYSPSC pursuant to Section 68(1) of the Public Service Law seeking a Certificate of Public Convenience and Necessity for the Project. Ball Hill has reviewed the list of standard information requests regarding Wind Energy Projects subject to PSL Section 68 CPCN Review and will submit the information as part of the Petition for Issuance of a Certificate of Public Convenience and Necessity. Answers to the questions that relate to environmental findings are summarized and presented throughout the SDEIS and FEIS.
SDEIS-0002-1	Public Service Commission	The Department of Public Service (DPS) Staff inadvertently neglected to attach a document referenced in submitted comments regarding the Supplemental Draft Environmental Impact Statement for the Ball Hill Wind Project, dated March 14, 2016. Please see the attachment entitled "Standard Information Requests for Wind Energy Project §68 CPCN Review"	See response to comment ID SDEIS-0001-14 above.
SDEIS-0003-1	Department of Environmental Conservation	Executive Summary, Section Alternative Project Location and Design: This section states that the preliminary analysis of the Project Area was conducted in 2006 and later continued in 2015. Since conditions and potential constraints within the Project Area have changed during this time, the SDEIS should address how the alternatives analysis was updated given the length of time that has elapsed.	In the revised layout presented in this FEIS, the Project minimizes environmental impacts, taking into account the community's input while maintaining the Project's energy generation capacity and maximizing energy efficiency. Ball Hill engaged in a detailed process of micrositing and analyzing engineering options and controls in order to minimize or avoid Project environmental impacts identified in the January 2016 SDEIS. Please refer to the FEIS, Section 1.3, for a detailed comparison of the Project from the SDEIS to the FEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-37	Department of Environmental Conservation	As changes are made to the Project area, access roads, electric lines, and turbine layouts, the applicant should provide the most current GIS shapefiles to NYSDEC to facilitate a timely and accurate review of potential impacts.	Shapefiles of the updated Project layout were provided to NYSDEC as part of the submittal of the Wetland and Waterbodies Report for the Project.
SDEIS-0004-1	Martin Huber	My name is Martin Huber, my family has lived on Round Top Rd. for over forty years. I am very concerned about the wind turbine project proposed for our town.	Ball Hill continues to work with the Towns of Villenova and Hanover to provide Project information and potential impact analysis on the positive and potentially negative impacts to the community from the Project.
SDEIS-0006-3	Greg Snow	This project should be put on hold pending completion of the Arkwright wind project so Villenova residents can properly evaluate the impacts of an industrial installation of this magnitude.	The potential environmental impacts of the project, which are affected by the size and number of turbines and other Project facilities, are evaluated in the SDEIS and this FEIS. In addition, the cumulative impacts of this Project and other proposed wind projects in the area (including the Arkwright Project) are analyzed in Section 1.4.16 of this FEIS.
SDEIS-0007-1	Christopher Warner	I am writing to express my frustration in supporting green energy, but being left out until the last minute in changes and size adjustments to an already very large change in our very rural land scape. As a result I must voice my strong opposition to the siting of extremely tall wind turbines on Ball Hill in the Town of Villenova unless some changes are put into place. My residence and farm is on Straight Road in the Town of Arkwright, less than 1.5 miles from turbine #2	The public hearing and public comment period were scheduled after the SDEIS was submitted to the Lead Agency and made available online and at public locations to give members of the public and government agencies an opportunity to comment on the Project. All comments were made available for review and consideration by the Lead Agency and the Project developer prior to preparation and submission of the FEIS and the Project application. An additional public hearing was held in Villenova on October 13, 2016 and on November 9, 2016 in the Town of Hanover. Section 1 and Appendix A of the FEIS describe the final layout of turbine locations and other project facilities, including the final location for Turbine 2.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-9	Christopher Warner	I care about producing green energy. I have recently installed solar panels at my residence to generate electricity without consuming fossil fuel. The solar panels do not move, do not tower over my house and trees, do not make noise and do not kill wildlife. I would have much rather seen a much smaller scaled green energy project developed to produce energy for use by local residents. One or two smaller turbines or a solar panel array could serve much of the energy need of the surrounding area, and provide benefit to all in the community that would bear the burden of having structures placed in or near our backyards. Instead, the power generated by these turbines will be transmitted outside of Chautauqua County, and due to the distance it will have to travel and the inefficiency of transmission lines, much of this energy produced on the backs of my community, will be lost before it reaches its final destination. I would like to know how much of the 100 MW of energy that would be generated by the Ball Hill Wind Project would be lost during transmission? While I want to see more green energy production, and less fossil fuel production, I am very concerned that green energy is being lost when wind power plants like Ball Hill Wind Project are not being sited closer to the cities that are using the power.	All electricity transmission is associated with some degree of lost power as the current travels along the line, whether the energy is generated through wind, solar rays, or another source. The amount or percentage of the energy generated by the project that will be lost during transmission will depend on where the electricity is ultimately used, which will not be decided by the Town or the Project Sponsor. As noted in the SDEIS, the availability and proximity of the high-voltage National Grid 230-kV Dunkirk-Gardenville transmission line that runs through the town of Hanover enhances the efficiency of the project, versus delivery at lower voltage, by reducing transmission line "losses."
SDEIS-0007-13	Christopher Warner	I work evenings and have been unable to attend community meetings so far. This doesn't mean I'm not very interested and I believe that in order for projects like this to be a success, the entire community should be involved and benefit. Project developers want to build turbines on the Chautauqua Ridge, the town has more negotiating power than it thinks.	Thank you for your comment.
SDEIS-0009-1	Doug Rumsey	I have heard a lot of talk of windmills being put In our community.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0011-2	Priscilla Titus	In general, I believe the development of alternative energy production facilities is necessary and worthwhile, but appropriate siting is crucial both to the success of the facility and to appropriate minimization and mitigation of unavoidable adverse impacts.	The potential impacts of the Project on visual resources, sound, land use, socioeconomics, and cultural resources have been thoroughly considered in the SDEIS and FEIS. Please refer to the FEIS Section 1 and corresponding appendices for descriptions of the analysis that was conducted and conclusions regarding potential impacts.
SDEIS-0011-8	Priscilla Titus	I do not agree that potential construction impacts would "generally be confined to properties of participating landowners, and would be temporary in nature". Obviously, neighboring property owners will be affected by the project both during and following construction in many ways, some of which are long-term.	Grading and fill activities resulting from construction of the Project would generally be confined to properties of participating landowners and would be temporary in nature. There is the potential for increased traffic on local roads from construction of the Project as described in Section 1.4.11 of this FEIS, which would also be temporary during construction. Restoration of areas impacted by construction will be conducted in accordance with commitments made in the SDEIS and FEIS. Other impacts from the construction and operation of the Project are analyzed in detail in this FEIS and attached reports.
SDEIS-0012-1	Peter Calanii	I am an Arkwright resident. I feel this project is very bad and wrong. Outdated turbines, not enough bond money, lousy corporate secrets, the usual corruption. If these come any closer to Arkwright you will have the fight of your corporate lives. "The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings." Masanobu Fukuoka	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0013-6	Jonathan Townsend	We cannot hope to tum the tide for our local bats if we keep justifying the need for projects such as this based on anthropo-centric minded values. While I applaud the desire to move away from fossil fuels, I do not think this is the right direction to take. As a consultant conducting post construction bat and bird fatality studies in WNY it wasn't unusual for me to drive 800 miles in a week to document fatalities, and when factoring in diesel truck operation for clearing, constructing and main-taining these facilities; as well as the removal of trees that store carbon; it becomes clear that the industry overall is anything but fossil fuel free.	Thank you for your comment.
SDEIS-0013-7	Jonathan Townsend	Human activities have created immense tracts of developed land - parking lots, roof tops and streets, that we can utilize for less intrusive methods of electricity generation like solar, or smaller scale, more bat friendly, wind energy units.	Thank you for your comment.
SDEIS-0014-1	Judy Phillips	This is the second letter I've submitted to the Villenova Town Board as the SEQRA lead agency for the proposed Ball Hill Wind Project. For the following reasons, I am asking the board members to stop this proposed industrial project from any further continuance by not accepting or approving the SDEIS and vote for the no build alternative.	Thank you for your comment.
SDEIS-0014-7	Judy Phillips	Town of Villenova wind laws would have to be amended to allow 500 foot turbines.	Ball Hill is seeking a variance from the respective Town Boards to allow for construction of the turbines. The maximum height for the select-ed turbine is 492 feet when a rotor blade is at the top of its rotation.
SDEIS-0014-9	Judy Phillips	I've spent many hours trying to understand this complex pro-ject, after reading the SDEIS, I am against this industrial pro-ject being constructed in the Towns of Villenova and Hanover.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-6	Tina Graziano	But why hurry now? There is a new design for a bladeless turbine coming out soon, no blades. It is said it's cheaper and easier to maintain with less moving parts, bird friendly, and easier on the landscape.	The wind turbines that will be installed for the Project will be Vestas Model V126-3.45MW IEC IIA/IIB turbines (V126), each of which will have a capacity to produce approximately 3.45MW of electricity. Using these currently available, well tested turbines allowed Ball Hill to remove seven turbines which had been in the SDEIS Project layout, reducing the Project footprint and impacts as the total number of turbines was reduced from 36 to 29. Please refer to the FEIS Section 1 for additional information, including a comparison of the Project design with the SDEIS. Additionally, Appendix B provides the specifications for the selected turbine.
SDEIS-0015-11	Angela Hughes	Just a thought. So -- but anyways, I'm for it and I can't see nothing but good things.	Thank you for your comment.
SDEIS-0015-13	Angela Hughes	So I'm just for it. I am. And like I said, I can't stress enough, I was all the way down in North Carolina and I heard about the meeting.	Thank you for your comment.
SDEIS-0015-15	Howard Crowell	I'm surprised there's this much opposition at all. I hadn't heard of any opposition across the townspeople that I talked to.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-26	Lisa Brain	Like there's a lot of things I'm for, but you're talking a windmill is that is two hundred fifty foot by twenty-five foot per wing, is that what we're talking about, the real big ones? ... And five hundred feet tall. But the wing span itself, okay, and then so that's kind of major, I think, in my back yard. And then the post just being -- if it's here you're talking -- okay.	The wind turbines that will be installed for the Project will be Vestas Model V126-3.45MW IEC IIA/IIB turbines (V126), each of which will have a capacity to produce approximately 3.45MW of electricity. As described in the FEIS Section 1, the V126 turbine is a three-bladed, upwind, horizontal-axis wind turbine with a rotor diameter of approximately 413 feet. The nacelle is located at the top of the tower and contains the electrical generating equipment. The turbine rotor and the nacelle are mounted on top of a tubular tower giving a rotor hub height of 285 feet. The maximum height for the turbine is 492 feet when a rotor blade is at the top of its rotation. See Appendix B, Turbine Specifications, of this FEIS for additional information.
SDEIS-0015-34	Richard Hagel	This power that the wind turbines generate, where will it be sold to? Who will this power go to? I was just hoping it would stay in New York State, but apparently you don't have any idea. We have the best power project in the country probably in Niagara Falls. What gets me is a lot of that energy goes to Ohio, you know, and it doesn't help our bills at all.	Ball Hill is seeking a contractual buyer for the power. Electrically, the power goes into the grid and the electrons flow to where they are needed on the grid, whether in or out of state, but the Project would help achieve New York State goals to increase the state's clean energy economy.
SDEIS-0015-37	Barry Nobles	Another thing is I'm from a community that has a landfill and we have a host agreement with the landfill and from the landfill point of view management of that is very important and the company that does that does a very good job, but it's important for the community to understand what goes into that can see some of the benefits so that's a case where that does work well. It's a tough thing. I think it's really important when everybody can get the information everybody can look at it and get people that are willing to listen to that. I think energy independence is very important. I just try to push energy independence forward. We don't have to send people to the Middle East to try to get resources.	Ball Hill will enter into Host Community Agreements with the Towns of Villenova and Hanover that will be agreed to by Ball Hill and the Town Boards.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-38	Dawn Ossont	Question, with the height of these turbines -- turbines, how close can they be to houses or cabins or that kind of -- any kind of structure? Are there requirements? I did go through some of the documentation online and I couldn't find that, but I imagine it's probably in there somewhere. So how close can they be?	The Towns require a minimum setback of 1,000 feet from residential structures. Ball Hill's policy is to site turbines beyond the minimum setback to distances of at least 500 meters (1,642 feet) from existing residences, whenever practicable. Structures, such as seasonal hunting cabins, that are not recognized by the Towns as residences would not be covered by the requirement.
SDEIS-0015-39	Dawn Ossont	I also noticed that the 2012 layout to this proposed layout, there is some changes as to where they were. Because of the taller turbines will that -- does that change again? Because for example, in 2012 there was one that was very, very -- a hundred yards of my parents' property, which is not on their property but very close to it. In 2016 it isn't there. Once -- if this all happens, are they going to move around, it's suddenly going to appear again where it wasn't? Is it different if it's a full-time residential home versus a seasonal cabin?	Changes to turbine locations are described in Section 1 of the FEIS. The total number of turbines was reduced from 36 potential turbines when the SDEIS was submitted to 29 turbines.
SDEIS-0015-41	Dawn Ossont	So how long do they -- what is -- how long do you expect them to be functional?	The useful life of the turbines is expected to be 25 years, but they could be operational for a considerably longer period if properly maintained.
SDEIS-0015-44	Judy Phillips	Approval of this type of project could cause community discord and division among neighbors, as it has often been reported in other rural communities.	Thank you for your comment.
SDEIS-0015-53	Michael Emke Walker	I hope nobody gets all pissed off because I'm for it and it seems like a lot of people are against it.	Thank you for your comment.
SDEIS-0015-57	Greg Snow	I also would be interested in knowing how this project was transferred from Duke Energy, what the possibilities are of it getting transferred again before the project is complete.	Duke Energy ceased activity on the Project and Ball Hill has continued it as Duke's successor. It is anticipated that the Project ownership may change in the future, and any successor would be bound by the conditions of all permits from and agreements with the Town of Villenova.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-58	Greg Snow	I have a question regarding these new much larger turbines. There are two proposed for this project and I'm going to assume we're going to get the largest of the two, the GE which is four hundred ninety-nine feet high.	The wind turbines that will be installed for the Project will be Vestas Model V126-3.45MW IEC IIA/IIB turbines, each of which will have a capacity to produce approximately 3.45MW of electricity. Using these currently available, well tested turbines allowed Ball Hill to remove seven turbines which had been in the SDEIS Project layout, reducing the Project footprint and impacts as the total number of turbines was reduced from 36 to 29. The maximum height for the selected turbine is 492 feet when a rotor blade is at the top of its rotation. Please refer to the FEIS Section 1 for additional information, including a comparison of the Project design with the SDEIS. Additionally Appendix B of this FEIS shows turbine specifications.
SDEIS-0015-60	Greg Snow	Are you saying that we could get even larger turbines?	The turbines for the Project have now been chosen: Vestas Model V126-3.45MW IEC IIA/IIB.
SDEIS-0015-61	Greg Snow	Part of my question there is how this project was transferred.	Duke Energy ceased activity on the Project and Ball Hill has continued it as Duke's successor. It is anticipated that the Project ownership may change in the future, and any successor would be bound by the conditions of all permits from and agreements with the Town of Villenova.
SDEIS-0015-64	Chuck Luce	How fast of the wind can they handle?	The cut-out wind speed of the V126/3.45MW turbine is 22.5 meters per second.
SDEIS-0015-65	Chuck Luce	A braking system?	When the wind hits the cut-out speed, the blades are feathered out of the wind so that they stop turning.
SDEIS-0015-66	Chuck Luce	How many of these towers do you have up now, you know, the whole outfit?	RES Americas has built thousands of large-scale turbines capable of generating over 8,000 MW.
SDEIS-0015-67	Greg Snow	How many in New York State?	Ball Hill would be one of RES Americas' first projects in New York State.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-75	Howard Crowell	We have a lot of gas wells in the area and they have continued issues. Will these windmills have tenders, people that come around and check them every so often or daily or weekly or monthly? How often will they be in this area?	Ball Hill plans to operate the Project with a staff of up to six full-time employees who would perform routine, preventive maintenance and unplanned work on the wind turbines under an O&M contract. A facility manager and an administrative assistant would be responsible for all O&M of the site, including administration and direction of turbine maintenance, technical oversight as required by the manufacturer, and operational coordination with both the utility grid system and local landowners. If needed, large repair tasks would be accomplished using both Project employees and third-party contractors.
SDEIS-0015-77	Chuck Luce	How many yards of concrete to hold one of them up? I know I put towers out in Tucson, Arizona, and we put like a hundred twenty-five yards just for small? How deep do they go down? We were more than forty-five feet deep.	Geotechnical surveys will dictate final design parameters of the foundations. Foundations for these turbines are generally octagonal, approximately 65 to 70 feet across at the base, and extend 7 to 10 feet below grade. The wind turbine foundation design will be developed by a registered professional engineer licensed to practice in the State of New York. See Section 1.3.3 and Appendix C, Project Drawings, for additional information.
SDEIS-0015-78	Chuck Luce	What does that tower weigh without the concrete?	The total tower weight of the V126 would be 460,766 pounds or approximately 230 tons. See Appendix M, Transportation, for additional details on the size and weight of turbine components.
SDEIS-0015-79	Chuck Luce	It doesn't seem very deep to hold up a five-hundred-foot tower.	See response to comment ID: SDEIS-0015-77.
SDEIS-0015-80	Chuck Luce	You're going to do road pushes, running underground cable, or is it all overhead? Your transmission line is going to be above?	The collection system that will bring the electricity from the turbines to the substation will be constructed underground. An overhead transmission line will be constructed in Hanover to carry the electricity from the substation to a switchyard where it will be connected into the grid.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-81	Chuck Luce	You're going to have some big transmission lines going across Villenova there. You're going to run everything underground through that?	The collection system that will bring the electricity from the turbines to the substation will be constructed underground. An overhead transmission line will be constructed in Hanover to carry the electricity from the substation to a switchyard where it will be connected into the grid.
SDEIS-0015-83	Judy Phillips	Can it take as many as seven trailers to transport the components of one turbine and as many as sixty trailers to transport the large capacity crane? More than forty just to transport the crane, correct?	It is estimated that 348 truckloads (12 truckloads per turbine) will be required to deliver turbine components to the Project Area. See Appendix M, Transportation, for additional details on the size and weight of turbine components.
Bird and Bat Resources			
SDEIS-0003-15	Department of Environmental Conservation	Although the shrubby young forest may provide valuable habitat to a suite of bird species after clearing, the forest interior species that depend on contiguous forest will be negatively impacted by the loss of cover and habitat fragmentation caused by turbines, roads, and other infrastructure. Any contiguous forest block of 150 acres or larger is valuable forest habitat-viable for many bird species that require interior forests for breeding. Most of these species are protected by federal and State laws such as the Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), Part 182 of New York Codes, Rules and Regulations (NYCRR), and Article 11 of the NYSE CL.	A habitat fragmentation analysis looking at direct and indirect impacts to "valuable" forested habitat has been conducted for the Project, the results of which are detailed in Section 1.4.5, Biological Resources, and 1.4.16, Cumulative Impacts. The analysis was conducted using guidelines presented in "NYSDEC direct and indirect impacts to interior wildlife species" and has been conducted following the NYSDEC document titled *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects*, June 2016. The analysis found there are 12 blocks of forested land greater than 150 acres in size. The Project would impact 118.9 acres of forested land in total, and would increase the number of forest blocks greater than 150 acres to 15 and would cut one forest block into a size smaller than 150 acres. More details can be found in Section 1.4.5 of this FEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-16	Department of Environmental Conservation	The applicant should consider layout design and factors to minimize impacts to forest interior breeding birds and bats and to mitigate for unavoidable forest clearing. These may include but are not limited to, placing turbines as close as possible to forest/field edges to reduce impact to both habitat types, conducting all tree clearing outside of the primary bird nesting season (April 1-August 31) and bat emergence, roosting and swarming period (April 1-0ctober 31); and communicating with NYSDEC and USFWS about options to mitigate for direct and indirect loss of forest interior habitat.	Ball Hill engaged in a detailed process of micrositing and analyzing engineering options and controls in order to minimize or avoid the Project's environmental impacts identified in the January 2016 SDEIS. Turbines were placed closer to forest/field edges where possible to reduce impact to both habitat types (such as Turbine 2 and 21). Table 1.3-2 in the FEIS identifies how turbines were re-sited from the SDEIS to the FEIS. Tree clearing will be conducted between November 1 and March 31 to avoid impacts during the bat emergence, roosting, and swarming period. This range also minimizes potential impacts to birds since these dates are beyond the primary bird nesting season. Ball Hill is also preparing a Bird and Bat Conservation Strategy (BBCS) in coordination with NYSDEC and USFWS that will apply best management practices (BMPs) and other features to minimize potential impacts to these resources during construction and operation of the Project.
SDEIS-0003-17	Department of Environmental Conservation	2.6 Bird and Bat Resources Breeding Bird Survey It is unclear why information on existing bird and bat resources in the Project area would be located in Section 2.11, Traffic and Transportation.	There was a typographical error in the SDEIS and the wrong section was referenced. Details on Bird and Bat Resources were presented in Section 2.6 and Appendix J in the SDEIS and are presented in Section 1.4.6 and Appendix H, Bird and Bat Resources, in this FEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-18	Department of Environmental Conservation	One grasshopper sparrow, a State species of special concern and grassland breeding species, was observed during the 2011 breeding bird survey. Information on precisely where the bird was observed, the duration of each observation, any breeding behavior seen, and other relevant notes should be provided to determine if any Project components may impact this species.	One Grasshopper Sparrow (New York State species of special concern) was detected during the 2008, 2011, and 2016 breeding bird surveys. Each location was different, but they shared being in agricultural locations dominated by tall grasses. In 2008 the Grasshopper Sparrow was sighted at a survey point (K) along Ball Hill Road in Villanova just south of the Town Line. This is closest to Turbines 30 and 29 (turbine 29 has since been dropped from the Project, see Table 1.3-2 in Section 1 of this FEIS). In 2011 the Grasshopper Sparrow was heard near Noble T65 along Route 39 in the Town of Hanover. The closest turbine was Turbine 38 in the SDEIS layout, although relatively far away. This turbine has since been dropped from the Project (see Table 1.3-2 in Section 1 of this FEIS). One Grasshopper Sparrow was also heard singing several times near the midpoint of transect PA-3 in 2016, which is dominated by tall grasses and scattered shrubs.
SDEIS-0003-19	Department of Environmental Conservation	Eagle Surveys The eagle population in the vicinity of the Project has increased significantly since eagle surveys were conducted and the number of eagle nests near the Project has also increased. Throughout this section, these changes in the eagle population should be incorporated into the discussion of potential impacts	Changes in the local eagle population were included in the discussion of potential impacts in the SDEIS. Additionally, Ball Hill initiated a second year of eagle point-count surveys at this site in March 2016. Results to date are included in the FEIS in Appendix H, Bird and Bat Resources.
SDEIS-0003-20	Department of Environmental Conservation	Eagle surveys should be repeated within the project area with updated survey points that adequately sample the current proposed project layout.	Changes in the local eagle population were included in the discussion of potential impacts in the SDEIS. Additionally, Ball Hill initiated a second year of eagle point-count surveys at this site in March 2016. Results to date are included in the FEIS in Appendix H, Bird and Bat Resources.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-21	Department of Environmental Conservation	Passive Bat Acoustical Study (2012) and Northern Long-Eared Bat Acoustic Survey (2015) During the acoustic survey conducted in 2012, the two detectors placed on a meteorological tower recorded 2243 calls that were able to be identified, 469 (20.9%) of which were Myotis species. No further analysis of the Myotis species calls were conducted, as the northern long-eared bat (NLEB) was not listed as threatened at the time, so it is unknown how many of these calls may have been made by northern longeared bat. The 2015 survey determined probable presence of NLEB on the site, and it is possible the species was recorded in 2012 as well. NYSDEC requests the 2012 acoustic data be reevaluated to determine if NLEB were detected on site, and the date(s) of any potential NLEB calls.	The Myotis species calls from the 2012 acoustic data were reevaluated to determine the potential presence of northern long-eared bat. Six northern long-eared bat calls were detected at the low microphone. The analysis is included in Appendix H, Bird and Bat Resources.
SDEIS-0003-22	Department of Environmental Conservation	2.6.1 Construction Impacts This section states, " .... it is uncertain when tree clearing activities would be conducted" and "tree clearing during the late spring, summer, or early fall would have the greatest potential to have an adverse impact on nesting birds." Sections 2.6.1.1 and 2.6.1.2 both declare that no significant adverse impacts are expected as a result of construction of the Project. The applicant should explain why no adverse impacts are expected during Project construction when the dates of tree removal have not been determined.	The exact timing of tree clearing is not known at the time an SDEIS is prepared. Ball Hill will conduct tree clearing between November 1 and March 31 to avoid impacts during the bat emergence, roosting, and swarming period. This will also minimize potential impacts to breeding birds as these dates are beyond the primary bird nesting season.
SDEIS-0003-23	Department of Environmental Conservation	Section 2.6.1.2 also states that the majority of construction activities would occur in agricultural fields; however, based on the maps provided in the SDEIS (e.g. Figure 1.1-2), over half of the turbines appear to be sited in forested areas. NYSDEC staff requires that no tree clearing take place between April 1 and October 31 to protect birds and bats during the breeding, migration, and fall swarming period	The layout was adjusted to reduce forest impacts. Also see previous response and response SDEIS-0003-16.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-24	Department of Environmental Conservation	2.6.1.3 Construction-Potential Impacts on Threatened or Endangered Bird Species This section briefly discusses monitoring in grassland and forested areas for the presence of sensitive and listed species. NYSDEC requests more information on the protocols to be used during such monitoring, including the locations, timing and duration of surveys, number of personnel involved in the monitoring, and how notification of the discovery will be conveyed. The applicant should describe the proposed avoidance and minimization techniques if a nest is found.	See response to comment SDEIS-0003-22. As clearing will occur in the window of November 1 through March 31 to address concerns with bat habitat, this will also greatly reduce potential impacts with breeding bird species as most species breed later in the spring and summer. For proposed clearing of forested areas between January 1 and March 31 and grassland areas between March 1 and March 31, the environmental supervisor will traverse the areas to be cleared within two weeks of the scheduled start of clearing and search for bird nests. Should any active nests be located, the location will be documented and NYSDEC and USFWS will be consulted to discuss potential avoidance and minimization measures. This text has been added to the Environmental Monitoring Plan for the Project, see Appendix S of this FEIS.
SDEIS-0003-25	Department of Environmental Conservation	As the project footprint, access road and turbine layout change, the applicant should provide the most current GIS shape files NYSDEC to facilitate timely and accurate review of potential impacts.	Updated Project shapefiles were provided to NYSDEC as part of the submittal of the Wetland Delineation Report for the Project.
SDEIS-0003-26	Department of Environmental Conservation	2.6.1.4 Construction-Potential Impacts on Bats This section commits to minimizing adverse construction impacts on bats and their roost trees, should tree clearing take place during the spring, summer or early fall periods. In coordination with NYSDEC and USFWS, a qualified biologist(s) will conduct tree inventories and monitor for presence through the use of acoustic detectors and/or exit surveys. To date, NYSDEC has not participated in discussions about this activity and staff encourages the applicant to develop a protocol for such work, should tree clearing occur during the time bats may be active on the site.	The exact timing of tree clearing is not known at the time an SDEIS is prepared. Ball Hill will conduct tree clearing between November 1 and March 31 to avoid impacts during the bat emergence, roosting, and swarming period. This will also minimize potential impacts on breeding birds as these dates are beyond the primary bird nesting season. It will not be necessary to conduct tree inventories or exit surveys with the proposed timing.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-27	Department of Environmental Conservation	2.6.1 .5 Construction-Potential Impacts on Threatened or Endangered Bat Species As previously noted, tree clearing is prohibited between April 1 and October 31 if State and federally threatened northern long-eared bats occupy a site. Since the presence of northern long-eared bat has been determined to be probable in the Project area during the summer, DEC recommends no tree clearing take place during that time.	The exact timing of tree clearing is not known at the time an SDEIS is prepared. Ball Hill will conduct tree clearing between November 1 and March 31 to avoid impacts during the bat emergence, roosting, and swarming period. This will also minimize potential impacts on breeding birds, as these dates are beyond the primary bird nesting season. It will not be necessary to conduct tree inventories or exit surveys with the proposed timing.
SDEIS-0003-28	Department of Environmental Conservation	2.6.2 Operational Impacts DEC recommends an operational curtailment regime designed to minimize direct impacts to bats. The applicant should engage in discussions with NYSDEC and USFWS to determine the appropriate timing and environmental conditions during which curtailment should take place.	Ball Hill engaged in discussions with NYSDEC regarding an operational curtailment regime. These discussions are continuing through development of the Ball Hill BBCS. With such a regime in place it, is anticipated that mortality of Myotis bats will be greatly reduced.
SDEIS-0003-29	Department of Environmental Conservation	2.6.2.1 Operational-Potential Impacts on Migratory Birds-Passerines The Department does not agree with the statement that the Project area is not immediately proximate to any large waterbodies that nocturnal migrants would use as stopover areas because all of the turbines are less than 12 miles from Lake Erie and the northern portion of the Project area is less than five miles from the Lake shore. As migrant birds, particularly songbirds, moving north in the spring utilize the areas along both Lakes Erie and Ontario, there is the potential for a higher than average mortality rate to occur at the Ball Hill project. The applicant is encouraged to work closely with NYSDEC and USFWS to develop appropriate post-construction monitoring studies that estimate bird and bat mortality and avoidance levels.	There is scant evidence to support that turbines located between 7 and 12 miles from the Lake Erie shore would provide a higher than average avian mortality rate. Migrant birds moving north in spring will utilize stopover habitats everywhere in the state. Stopover habitats are of increased importance within a few miles of a lakeshore, but not 7 to 12 miles. Ball Hill is developing a post-construction monitoring approach as part of the BBCS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-30	Department of Environmental Conservation	2.6.2.2 Operational-Potential Impacts on Breeding Birds Department staff believes that Figure 1.1-2 does not support the statement that the majority of the turbines would be sited in agricultural fields and open areas. In fact, Figure 1.1-2 shows approximately 19 turbines, or just over half, will be located in forested habitats. Additionally, some of the access roads, electric collection lines, and a large portion of the transmission lines are also located in forested areas. The post construction monitoring study will investigate the indirect impacts on birds in forested and grassland habitats from turbines and other project components and will be developed in consultation with NYSDEC and USFWS.	See response to SDEIS-0003-16. Ball Hill is developing a post-construction monitoring approach as part of the BBCS. A detailed protocol will be agreed upon with NYSDEC in advance of implementation, which is typically the first full year following construction completion.
SDEIS-0003-31	Department of Environmental Conservation	2.6.2.5 Operational-Potential Impacts on Threatened or Endangered Bat Species. The applicant must discuss the need for an incidental take permit for northern long-eared bats with NYSDEC staff due to the potential risk of collision with turbines at Project. The applicant should coordinate with NYSDEC and USFWS to discuss avoidance, minimization and mitigation techniques that will provide adequate protection to northern long-eared bats. Appropriate turbine cut-in speeds may vary with the time of year, time of day, and weather conditions.	Ball Hill engaged in discussions with NYSDEC regarding an operational curtailment regime that when implemented would make the potential take of a northern long-eared bat highly unlikely to occur. These discussions are continuing through development of the Ball Hill BBCS, which may make a state-level incidental take permit unnecessary.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-32	Department of Environmental Conservation	2.6.2.6 Bird and Bat Fatality Approximations Table 2.6-4 should be updated to reflect all the available post-construction monitoring reports from New York available to date including the Steel Winds project. Steel Winds is the closest operating project to Ball Hill and is located on the shore of Lake Erie in Lackawanna. Bird mortality estimates at Steel Winds ranged from 7.15-8.46 birds per turbine and 2.89-3.38 birds per megawatt in 2012, and 6.92-15.5 birds per turbine and 2.77-6.2 birds per megawatt in 2013. This information should be used to calculate fatality estimates in this section and elsewhere in the SDEIS.	The tables have been updated and are included in Section 1.4.16 of the FEIS. The exclusion of the 2012 was an oversight and Ball Hill was unaware of a 2013 study. While the rates from these studies at Steel Winds were on the higher end of rates in New York State, it is also notable that many of the avian fatalities were of gulls from the adjacent Ring-billed Gull colony. When gulls are removed from the mix of avian species found, the avian fatality rates are not at the higher end of studies conducted in New York State and within the range of numbers used in the SDEIS. Thus, the high end rate used in the SDEIS is still applicable for avian fatality approximations.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-34	Department of Environmental Conservation	Though DEC is unaware of exact roost locations for northern long-eared bats near the project area, the species is known to occur in Chautauqua County. Individuals have been captured in mist nets in the towns of Chautauqua and Ellington and the applicant's acoustic monitoring suggests northern long-eared bat is present on site.	Ball Hill engaged in a detailed process of micrositing and analyzing engineering options and controls in order to minimize or avoid the Project's environmental impacts identified in the January 2016 SDEIS. Turbines were placed closer to forest/field edges where possible to reduce impact to both habitat types (such as Turbine 2 and 21). Table 1.3-2 in the FEIS identifies how turbines were re-sited from the SDEIS to the FEIS. Tree clearing will be conducted between November 1 and March 31 to avoid impacts during the bat emergence, roosting, and swarming period. This range also minimizes potential impacts to birds since these dates are beyond the primary bird nesting season. Ball Hill is also preparing a BBCS in coordination with NYSDEC and the USFWS that will apply BMPs and other features to minimize potential impacts to these resources during construction and operation of the Project. Ball Hill engaged in discussions with NYSDEC regarding an operational curtailment regime. These discussions are continuing through development of the Ball Hill BBCS. With such a regime in place it is anticipated that mortality of Myotis bats will be greatly reduced.
SDEIS-0003-35	Department of Environmental Conservation	To reduce potential impacts to bats, NYSDEC recommends all tree clearing be conducted in the winter, between November 1 and March 31. DEC also recommends operational curtailment during periods when bats may be present and most active	Ball Hill engaged in discussions with NYSDEC regarding an operational curtailment regime. These discussions are continuing through development of the Ball Hill BBCS. With such a regime in place, it is anticipated that mortality of Myotis bats will be greatly reduced.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-57	Department of Environmental Conservation	Appendix K-Results of 2011 Breeding Bird Surveys at the Ball Hill Wind Energy Project Area, August 2011 Additional information on the grasshopper sparrow, a State species of special concern and grassland breeding species, should be provided. This species was recorded in the 2007, 2008, and 2011 surveys. Information on precisely when and where the birds were observed, the duration of each observation, any breeding behavior seen, and other relevant notes should be provided to determine if any project components may impact this species.	One Grasshopper Sparrow (New York State species of special concern) was detected during the 2008, 2011, and 2016 breeding bird surveys. Each location was different, but they shared being in agricultural locations dominated by tall grasses. In 2008 the Grasshopper Sparrow was sighted at a survey point (K) along Ball Hill Road in Villanova just south of the Town Line. This is closest to Turbines 30 and 29 (turbine 29 has since been dropped from the Project; see Table 1.3-2 in Section 1 of this FEIS). In 2011 the Grasshopper Sparrow was heard near Noble T65 along Route 39 in the Town of Hanover. The closest turbine was Turbine 38 in the SDEIS layout, although relatively far away. This turbine has since been dropped from the Project, see Table 1.3-2 in Section 1 of this FEIS. One Grasshopper Sparrow was also heard singing several times near the midpoint of transect PA-3 in 2016, which is dominated by tall grasses and scattered shrubs.
SDEIS-0003-58	Department of Environmental Conservation	As all of the breeding bird surveys were conducted as points, rather than transects, post-construction surveys may not be directly comparable if done following current recommendations. The SDEIS should discuss the NYSDEC protocol that will provide the best data for post-construction breeding bird surveys.	An additional breeding bird survey was conducted in June 2016 following the current NYSDEC protocol of using transects. This will allow comparison for post-construction breeding bird survey results. The updated Breeding Bird Survey report is attached to this FEIS in Appendix H, Bird and Bat Resources.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-59	Department of Environmental Conservation	Appendix K-Eagle Surveys at the Proposed Ball Hill Windpark, February 2013 There are currently 18 known bald eagle nests within 10 miles of the current Ball Hill Project boundary: 2 within 2 miles, 5 between 2 and 5 miles away, and 11 between 5 and 10 miles away. Nesting bald eagles in this area are known to use the proposed Project Area. The potential for significant impacts to these and other nesting pairs, exists if the operating Project causes a direct injury or mortality or if birds avoid the area due to the presence of turbines. The applicant is encouraged to request and review the most recent information available from the Natural Heritage Program regarding listed and sensitive species, and continue to communicate with NYSDEC and USFWS about avoidance, minimization and mitigation for any potential impacts to eagles as a result of the construction and operation of the Project.	Ball Hill continued to communicate with NYSDEC and the USFWS regarding eagle nests, sightings, and recent activities. An updated Natural Heritage Program letter was received and is included in this FEIS in Appendix G, Agency Correspondence. Ball Hill is preparing an Eagle Management Plan (Eagle MP) as part of the BBCS process.
SDEIS-0003-60	Department of Environmental Conservation	Appendix L-Bat Acoustic Monitoring Report for the Proposed Ball Hill Windpark, February 2013 NYSDEC requests the 2012 acoustic data be reevaluated to determine if northern long eared bat were detected on site, and the date(s) of any potential northern long-eared bat calls. As 20.9% of all calls identified were Myotis calls, it is possible that northern long-eared bat were recorded during the 2012 surveys.	The Myotis species calls from the 2012 acoustic data were reevaluated to determine the potential presence of northern long-eared bat. Six northern long-eared bat calls were detected at the low microphone. The analysis is included in Appendix H, Bird and Bat Resources.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-61	Department of Environmental Conservation	Appendix L-Bat Acoustic Survey Report for the Ball Hill Wind Project, November 2015 Acoustic monitoring conducted July and August, 2015 following USFWS 2015 guidance indicated the State listed threatened northern long-eared bat may be present on site. Since State regulations prohibit the taking or disturbance of a listed species within their habitat without a permit, NYSDEC encourages the applicant to discuss next steps to avoid, minimize and mitigate for impacts to this species as a result of the construction and operation of the Ball Hill project. Such avoidance and minimization measures may include date restrictions on tree clearing and operational curtailment during periods when bats are likely to be most active.	Ball Hill engaged in discussions with NYSDEC regarding an operational curtailment regime. These discussions are continuing through development of the Ball Hill BBCS. With such a regime in place it is anticipated that mortality of Myotis bats will be greatly reduced. Ball Hill engaged in discussions with NYSDEC regarding an operational curtailment regime that when implemented would make the potential take of a northern long-eared bat to be highly unlikely to occur. These discussions are continuing through development of the Ball Hill BBCS, which may make a state-level incidental take permit unnecessary. Ball Hill engaged in a process of micrositing and analyzing engineering options and controls in order to minimize or avoid the Project's environmental impacts identified in the January 2016 SDEIS. Turbines were placed closer to forest/field edges where possible to reduce impact on both habitat types (such as Turbine 2 and 21). Table 1.3-2 in the FEIS identifies how turbines were re-sited from the SDEIS to the FEIS. Tree clearing will be conducted between November 1 and March 31 to avoid impacts during the bat emergence, roosting, and swarming period. This range also minimizes potential impacts to birds since these dates are beyond the primary bird nesting season. Ball Hill is also preparing a BBCS in coordination with NYSDEC and the USFWS that will apply BMPs and other features to minimize potential impacts to these resources during construction and operation of the Project.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-8	Christopher Warner	I am concerned about the impact the turbines will have on birds. I have been feeding migratory ruby throated hummingbirds at my residence for 18 years. I have counted from 16-22 hummingbird individuals that feed on my property, and on average 6-8 pairs nest next to the feeders on my property each year. I am also aware of a nearby bald eagle nest, and am concerned that bird strikes will occur due to the size and speed of the turbines- 160 miles per hour. I care very much about the health of the wildlife, and do not want to see birds or bats killed by the turbines.	All forms of energy generation have some level of impacts on wildlife. For wind, avian mortality at New York State wind projects has ranged from 0.7 to 9.3 birds per turbine per study period (the 2013 study at Steel Winds was higher at 15 birds per turbine but many of those were gulls from a large breeding colony immediately adjacent to the site), or 0.4 to 5.63 birds per MW per study period. Hummingbirds have not demonstrated a high level of mortality from operating wind farms, and they would be expected to remain active in an operating Project Area, including breeding. The Bald Eagle nests in the vicinity of the Project were discussed in the SDEIS and updated in the FEIS and a second year of eagle surveys is underway (see Appendix H, Bird and Bat Resources); results to date have shown eagles flying in the Project Area, but not with great frequency. Ball Hill Wind is preparing an Eagle MP, which will include BMPs to reduce potential impacts to eagles from this Project.
SDEIS-0011-7	Priscilla Titus	Adverse impacts to wildlife including birds and bats is inadequately addressed because it does not take into account the effects of habitat degradation and fragmentation and the effects of noise and visual disturbances including those involved in maintenance.	Ball Hill Wind took many factors into consideration when updating the layout and reducing the number of turbines to 29 for this Project. The forest clearing and habitat fragmentation values are updated and discussed in Section 1 of the FEIS. Ball Hill Wind is preparing a BBCS that will include BMPs to reduce potential impacts during construction and operation.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0013-3	Jonathan Townsend	Construction activities are part of the process of habitat fragmentation. The Ball Hill SDEIS claims that construction activities "would not be expected to have a significant adverse effect on bat populations because bats are most active at night when construction is not taking place and because they can temporarily relocate". Bats ARE most active at night, but they still need to sleep, which occurs during the time that construction activities are occurring, so this will still have an impact. Bats CAN relocate - but this relocation puts stress on bats that would normally not occur, places them at an elevated risk of predation, and lowers their success in reproduction and foraging, which can potentially impact the entire local population.	Clearing will be conducted between November 1 and March 31 and, thus, will not impact northern long-eared bat or other species.
SDEIS-0013-4	Jonathan Townsend	Long known for the impact on bird populations, the wind energy industry actually has greater impacts on bats. On average, around 500,000 individual bats are killed each year in the United States as a result of wind turbine operation. Couple this with the losses from White Nose Syndrome (WNS), a disease affecting cave hibernating bat species, and this becomes a very real conservation issue. Nearly 6 million bats have died in the US since WNS was discovered, also in that time an additional 5 million bats may have died from wind energy related fatalities.	There have been multiple bat studies at this site as well as similar results from studies at nearby proposed wind projects. The greatest potential of impacts on bats is through collisions with turbines. This most often occurs in the late summer and early fall time period. Ball Hill is coordinating with NYSDEC regarding BMPs during this period as part of a BBCS. The impact to bats will be greatly reduced through implementation of these BMPs.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0013-5	Jonathan Townsend	Depending on whether you use the SDEIS estimates of bat fatality regarding individual turbines or based on the overall megawatts of turbine production, mortality rates of up to 1440 - 1630 individuals per survey season (roughly April to November) are possible. Bats reproduce slowly, generally having just one pup per year. When populations become impacted in this way, it becomes harder and harder for these species to replace those lost each year, and still maintain a viable, thriving population. Wind energy disproportionately impacts the migratory "tree" bats, while WNS largely impacts "cave" bats - between both of these major sources of mortality each group has been put under extreme pressure. These are just two sources, among dozens of other issues such as human persecution, environmental toxins (heavy metals, pesticides, herbicides etc), and an unstable, unpredictable climate. Each individual bat is crucial, especially for species such as the northern long eared and little brown bats - who have experienced dramatic declines (90-98%) in NYS resulting from WNS, and who are likely to inhabit or utilize the project area for this wind park	There have been multiple bat studies at this site as well as similar results from studies at nearby proposed wind projects. The greatest potential of impacts on bats is through collisions with turbines. This most often occurs in the late summer and early fall time period. Ball Hill is coordinating with NYSDEC regarding BMPs during this period as part of a BBCS. The impact to bats will be greatly reduced through implementation of these BMPs.
SDEIS-0013-6	Jonathan Townsend	We cannot hope to tum the tide for our local bats if we keep justifying the need for projects such as this based on anthropocentric minded values. While I applaud the desire to move away from fossil fuels, I do not think this is the right direction to take. As a consultant conducting post construction bat and bird fatality studies in WNY it wasn't unusual for me to drive 800 miles in a week to document fatalities, and when factoring in diesel truck operation for clearing, constructing and maintaining these facilities; as well as the removal of trees that store carbon; it becomes clear that the industry overall is anything but fossil fuel free.	Thank you for your comment.
SDEIS-0013-7	Jonathan Townsend	Human activities have created immense tracts of developed land - parking lots, roof tops and streets, that we can utilize for less intrusive methods of electricity generation like solar, or smaller scale, more bat friendly, wind energy units.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0013-8	Jonathan Townsend	Projects like this one at Ball Hill will take a rural, agricultural, or forested region, and dot it with enormous, intrusive turbines that will irrevocably change the landscape. Bats everywhere are in deep, deep trouble. Not just locally, but worldwide. They are also extremely crucial organisms, and the more biologists study them, the more crucial they appear to be. In this age of spreading mosquito borne pathogens, destructive agricultural pests, or other insect related issues, it makes sense to conserve our bats, not add to their woes. If not for their intrinsic value, let's conserve them based on ecological economics, for bats provide billions of dollars in ecological services that often go unnoticed. I ask that you please consider the impact this project will have on bats - ANY impact is unacceptable when considering the mounting issues they currently face.	Thank you for your comment.
SDEIS-0015-3	Tina Graziano	Not only will we constantly have this in our face, I have to observe every turbine killing and maiming our wildlife. I counted twenty-two turbines all around wet spots. What are you thinking? There's nothing on these turbines about the bats.	Less than one acre of wetlands is expected to be permanently filled by the Project. Wet areas within the Project are identified in detail in Appendix E of this FEIS, Water Quality and Wetlands. Ball Hill worked diligently to avoid wetland areas and minimize impacts on these areas. Ball Hill also sited turbines with the intent to minimize impacts on wildlife and the environment. Section 1.4.5 and 1.4.6 of the FEIS identifies the potential environmental impacts from the Project on wildlife and biological resources.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-4	Tina Graziano	They will get a permit to allow them to cover the eagle kill. Just look up sometime and notice all the bird activity we enjoy. Our eagles are here, the herons, hawks, ducks, geese and songbirds will be executed or injured daily. Birds that get too close will have their lungs ruptured. This is disgusting, a cruel waste for nothing gained.	Project facilities have been sited to minimize impacts on wetlands. Please refer to Section 1.3 and Appendix E, Water Quality and Wetlands, and Appendix F, Conceptual Wetland Mitigation Plan, of the FEIS for more information. All forms of energy generation have some level of impacts to wildlife. For wind, avian mortality at New York State wind projects has ranged from 0.7 to 9.3 birds per turbine per study period, or 0.4 to 5.63 birds per MW per study period. The potential impacts of the Project on bats, eagles, and other avian species are analyzed and discussed in the SDEIS and the FEIS. Please see Section 1.4.6 and Appendix H, Bird and Bat Resources, of the FEIS regarding bats and avian species and mitigation to reduce potential impacts.
SDEIS-0015-9	Angela Hughes	I'm retired military. I've traveled all over the world and they've had -- for many, many years overseas we have had them, and I have nothing but good things to say about them. Number one, if you're talking about -- I mean, it's cleaner than any other energy you can use. I really totally believe that with my whole heart. And if the birds are that darn stupid --I don't know. I mean, I'm not trying to be funny, but there's not that many birds killed compared to the, you know, environmental issue on it.	Thank you for your comment.
SDEIS-0015-16	Howard Crowell	I remember reading one of the Burke Hill studies back then and the list of priority on what killed the birds, the automobile and the birds of prey, and the last thing the front of your house and all that stuff right down through there, your neighborhood kid with a BB gun, you get down about ten, twelfth place, about one or two percent of your bird kills that's where the windmills is. There's stuff killing birds long before any windmills kill birds.	Please refer to Section 1.4.6 and Appendix H, Bird and Bat Resources, of this FEIS for a detailed assessment of potential impacts on birds.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-47	Judy Phillips	An eagle nest is located less than a mile from some of the proposed turbines. There are four eagle nests involved. Though it is a protected species, majestic bald eagles are killed by rotating blades, and other birds and bats.	All forms of energy generation have some level of impacts to wildlife. For wind, avian mortality at New York State wind projects has ranged from 0.7 to 9.3 birds per turbine per study period, or 0.4 to 5.63 birds per MW per study period. The potential impacts of the Project on bats, eagles, and other avian species are analyzed and discussed in the SDEIS and the FEIS (see Section 1.4.6 and Appendix H, Bird and Bat Resources). In addition, breeding bird, bat, and eagle surveys and analysis were conducted and are presented in Appendix J of the SDEIS and Appendix H of this FEIS. Ball Hill is preparing a BBCS and Eagle MP in coordination with the wildlife agencies to reduce avian impacts.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Socioeconomics			
SDEIS-0004-2	Martin Huber	I want you to know that I am very much against construction of these wind turbines. I believe that living literally right next to one of these towers will negatively effect my land value, and quality of life. I have lived near the wind farm near Warsaw NY while attending college, and I know firsthand that living in one of these farms is not pleasant.	An analysis of the potential effects of the Project on property values is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to proximate location or location in the view shed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad-based value effects have occurred in those markets. Please refer to Appendix Q for additional information.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0005-4	Marlene McNeight	Something was mentioned about property taxes being lowered, but the irony is that the property value would be greatly decreased.	The Project developer and the Towns of Villenova and Hanover will enter into Host Community Agreements that will include payments from Ball Hill to each Town. An analysis of the potential effects of the Project on property values is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to proximate location or location in the view shed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad-based value effects have occurred in those markets. Please refer to Appendix Q for additional information.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0005-5	Marlene McNeight	A lot of money must be involved in this deal, at a great expense to the property owners of Villanova.	The Project Sponsor is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns. Please review Appendix Q, Property Valuation Study, which finds that there is no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to being in proximity or in the viewshed of an operational wind farm.
SDEIS-0005-6	Marlene McNeight	Why would the elected officials not be concerned about the people that elected them. This is definitely not in the interest of the property owners of Villanova but to all property owners of rural property.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0006-2	Greg Snow	This project will permanently negatively impact the quality of our rural life and the monetary value of our homes.	An analysis of the potential effects of the Project on property values is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to proximate location or location in the view shed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad based value effects have occurred in those markets. Please refer to Appendix Q for additional information.
SDEIS-0006-15	Greg Snow	Financial: How will homeowners be compensated in the event they are unable to sell their homes or can't sell them at a fair price (their inflation adjusted pre wind farm value)?	The comment mistakenly assumes that construction of the wind farm is the only factor that affects property values. In reality, there are many factors that influence the final sale price of a particular residential property and how quickly a given property is sold, such as the asking price, the condition of the property, the number of potential buyers in the market, mortgage interest rates, property taxes, etc. While the effect of wind farms on property values can and has been studied at the community level as described above, it would not be possible to determine precisely how much the proximity or visibility of a wind turbine or project facility contributed to an increase or decrease in

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
			the sale price of a particular property. An analysis of the potential effects of the Project on property values is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to proximate location or location in the view shed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad based value effects have occurred in those markets. Please refer to Appendix Q for additional information.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-2	Christopher Warner	I purchased my property in Arkwright, which was an abandoned farm and farmhouse at the time of purchase, because I wanted to invest and improve in the property, invest in the community, be a good neighbor, and live and farm in a rural, quiet, beautiful and peaceful region of Western New York.	A Visual Resources Assessment (VRA) was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and in combination with other proposed wind energy projects. A VRA was submitted as part of the SDEIS, and a revised VRA is included in the FEIS as Appendix I. In addition, a Property Valuation Study was conducted for the Project based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State. The study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to proximate location or location in the view shed of an operational wind farm. Please refer to Appendix Q of this FEIS for additional information.
SDEIS-0007-7	Christopher Warner	If I am forced to move due to the wind turbines negative impact on my family, I want to make sure that my property value has not decreased and recommend that as part of this review all residences within a 10 mile radius of the Project receive a current property assessment. The SDEIS says that studies show that there is no statistical difference in property values before and after turbines are constructed, but I am concerned about property values for residences like myself which are very close to turbines (O to 1.5 miles). A paper I looked up said that broadly there is no statistical negative impact on property values, but there is the possibility for negative impact to properties very close to the turbines (this information is from an article by Corey Lang, "The windy city: Property value impacts of wind turbines in an urban setting" Energy Economics 44 (2014)). I would like an assessment and a guarantee that if I have to sell because of the health of my children I will be compensated for the difference.	The comment assumes that the construction of the wind farm is the only factor that affects property values. There are many factors that influence the final sale price of a particular residential property and how quickly a given property is sold, such as the asking price, the condition of the property, the number of potential buyers in the market, mortgage interest rates, property taxes, etc. While the effect of wind farms on property values can and has been studied at the community level as described above, it would not be possible to determine precisely how much the proximity or visibility of a wind turbine or project facility contributed to an increase or decrease in the sale price of a particular property. The Property Valuation Study conducted for the

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
			Project (Appendix Q) analyzes home sales data out to 5 miles of wind farms, and also includes a literature review of other studies of the impact of wind farms on property values. According to the report, one such study, "Impacts of Windmill Visibility on Property Values in Madison County, New York" produced in 2006 by Ben Hoen of the Bard Center for Environmental Policy, "found no measurable effect of windmill visibility on property values and even indicated that this evidence holds when concentrating on homes within 1 mile of the turbines and on those that sold immediately following construction of the facility in 2001. This is by far the most extensive and soundly designed study completed to date." In addition, based upon investigation of potential health risks from proximity to the proposed wind turbines, as described in the FEIS, and Project design to avoid proximity impacts, no health effects are reasonably expected. Should health effects be determined to be caused by wind turbine operations, they would be addressed through the Complaint Resolution Procedure to be agreed upon with the Towns of Villenova and Hanover. Preconstruction real estate value assessments are not planned, nor are they seen to be necessary as property valuations are based on a wide range of factors.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-11	Christopher Warner	All the communities within and near the three projects should receive benefits, as we are those that will be living with the turbines every day. Compensation to property owners within the broader footprint of these three projects could be given such as free green energy, to help retain or improve properties and residences for those living near the turbines. This could aid to the ability of those attempting to go green with greenhouses operate and improve our community. Green energy and other benefits to nearby properties, not only those properties where the turbines are actually sited, should be negotiated by all the impacted towns, together. I think the town, and the residents could gain much more for what the impacted community is losing and risking. I don't think the impacted residents' needs are currently being represented well enough, and strongly encourage the town to work for better protections for us.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
SDEIS-0007-14	Christopher Warner	These are long-term impactful changes proposed for our community; I feel the town should negotiate for higher community compensation, compensation benefiting all individuals that are impacted visually, audibly and physically. Without this I feel we are getting the very short end of a very big stick.	Thank you for your comment.
SDEIS-0009-3	Doug Rumsey	Our hills look fine like they are. Plus the decrease in property values for this.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0010-2	Jonathan Titus	1. It is very important that a foolproof guarantee be associated with the project such that if the project is abandoned or decommissioned Renewable Energy Systems is obligated to restore all of the sites to the highest possible standards. This must be a large enough bond such that a clean-up will occur regardless of the status of Renewable Energy Systems. A lack of protection to local communities from abandoned energy projects has been a problem across the country.	In 2008, a decommissioning plan for the Project was reviewed and accepted as complete by the Villenova Town Board as (New York) State Environmental Quality Review Act (SEQRA) Lead Agency. The decommissioning plan has been updated and is included in the FEIS as Appendix R, Decommissioning Plan. The updated plan, prepared in accordance with the Town of Villenova Local Law No. 1 of 2007: Wind Energy Facilities Law, the Town of Hanover WECS Law (2008), and the terms and conditions of any agreements with the Towns, reflects current costs and numbers associated with decommissioning activities.
SDEIS-0012-1	Peter Calanii	I am an Arkwright resident. I feel this project is very bad and wrong. Outdated turbines, not enough bond money, lousy corporate secrets, the usual corruption. If these come any closer to Arkwright you will have the fight of your corporate lives. "The ultimate goal of farming is not the growing of crops, but the cultivation and perfection of human beings." Masanobu Fukuoka	Thank you for your comment.
SDEIS-0014-6	Judy Phillips	Wind power is intermittent, unreliable and heavily subsidized by taxpayer awards (surcharges on electric bills) though the NYSERDA renewable energy contract.	Ball Hill will enter into lease agreements with property owners and Host Community Agreements with the Towns. The financial aspects of these agreements will not be dependent on the amount of Ball Hill's revenue from the Project, so any risks associated with variable winds and changing subsidies will be assumed by the Project Sponsor.
SDEIS-0015-5	Tina Graziano	Cuomo is going to hand out a hundred and seventy-five million dollars for five New York State projects with Ball Hill listed as the largest bill. That's all money from us. You can find it right on your electric bill.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-12	Angela Hughes	Number one, I believe, and I may not be speaking right, but it's going to help us with our taxes. It's going to help us with our historic properties here, and we've got to admit this town is really going down and it needs some help and everyone could use some tax money here.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
SDEIS-0015-18	Richard Crowell	I think this is something the town could use. They need this money to do some work for the buildings and our roads, get them up to where they ought to be. And we had a gentleman there back in 2008, he was -- I can't remember his name, but he was the supervisor in the Town of Eagle. He came up and talked to us on the town board at that time and he was talking about how it helped them drop their tax rate to almost nothing and with all the extra money they could spend on the buildings and roads and stuff, and I think we could use it up here and we've needed it for a long time.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
SDEIS-0015-20	Cliff Rumsey	We hear a lot about the things where they are supposed to help townships and county -- I don't know if anybody has really done any homework. In the Pike area you see a lot of them up there. How much has it affected their area? Have their taxes been -- do they have a reduction in their taxes up there or is it just the landowners that made money or what is it? There's a lot to this.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
SDEIS-0015-22	Cliff Rumsey	And we're going to have the same thing here, but the benefit to them is that it's -- it's gonna help the township a lot I could understand, but what from I've read about these I don't think so.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-25	Lisa Brain	The money issue, the town could benefit. Great. I'm for that.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
SDEIS-0015-34	Richard Hagel	This power that the wind turbines generate, where will it be sold to? Who will this power go to? I was just hoping it would stay in New York State, but apparently you don't have any idea. We have the best power project in the country probably in Niagara Falls. What gets me is a lot of that energy goes to Ohio, you know, and it doesn't help our bills at all.	Ball Hill is seeking a contractual buyer for the power. Electrically, the power goes into the grid and the electrons flow to where they are needed on the grid, whether in or out of state, but the Project would help achieve New York State goals to increase the state's clean energy economy.
SDEIS-0015-36	Barry Nobles	Is there some kind of bond that's put up that these will be maintained?	The law requires the creation of a decommissioning bond that is updated on a regular basis, so that the town could remove the Project facilities if the company failed to do so. The decommissioning plan for the Project has been updated from the original 2008 version and is included the FEIS as Appendix R. The updated plan, prepared in accordance with the Town of Villenova Local Law No. 1 of 2007: Wind Energy Facilities Law, the Town of Hanover WECS Law (2008), and the terms and conditions of any agreements with the Towns, reflects current costs and numbers associated with decommissioning activities.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-45	Judy Phillips	There are people that have lived here all their lives, recently moved here, built or renovated their homes, own a summer home, pay their mortgages or plan to sell their home within twenty years. Their home may be the largest lifetime investment towards their retirement. The building of industrial wind turbines could devalue the property. They will tell you that it might not. Common sense dictates that given two identical properties in a rural area, one that is next to an industrial turbine versus one whose view does not include such a facility is likely considered more valuable.	An analysis of the potential effects of the Project on property values is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to proximate location or location in the view shed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad-based value effects have occurred in those markets. Please refer to Appendix Q for additional information.
SDEIS-0015-50	Judy Phillips	Serious financial issues have surfaced for the town hosting the aging -- which is the oldest, fifteen-year-old New York Madison wind farm and problems are also foreseeable in the near future for New York State's largest and now technology outdated Mapleridge wind turbine facility. And I have been there. I hope the board has researched problems in other rural communities due to wind turbine facilities.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-54	Michael Emke Walker	There is some people that are probably set with their money, but I am trying to farm and taxes are going up every year and I can't afford to keep paying them. That's the reason I'm trying to farm, because I would like to have a bigger chunk of land so I could farm.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
SDEIS-0015-55	Robert Crowell	I think I'm in favor of it. I'd love to go down to the Pike and Warsaw areas and see them. I've talked to quite a lot of farmers down there. I know quite a few in that area who have them on their own land, and I have two sisters that live right in the middle of the area. They say nothing but good things about them. We talk about their taxes and what they do to the community. And I read the articles, the things about the hills, and connect it a little bit with the Arkwright to know what's going on there. I know that it will bring a lot of revenue to the town and also I think there's probably at least two school districts and maybe the third that will benefit from the income that would be helping our taxes, and so I really -- I got to say that I don't know when they moved them now, but I did have one on the original proposal on Ball Hill.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
SDEIS-0015-56	Greg Snow	I'd like to know if the town gets a percentage of the generating money, the actual power that's generated.	The Host Community Agreements would specify the host community fees to be paid to the Towns, which would not be dependent on the amount of power generated. This approach allows the Towns to make budgetary decisions based on a predictable revenue stream from operation of the wind farm.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-62	Greg Snow	Whether or not the town gets a percentage of the generation.	The Host Community Agreements would specify the host community fees to be paid to the Towns, which would not be dependent on the amount of power generated. This approach allows the Towns to make budgetary decisions based on a predictable revenue stream from operation of the wind farm.
SDEIS-0015-68	Chuck Luce	You're paying royalties by what, you're metering it somewhere? Like a meter station or is every power metered? That's what you base your royalties on, right?	Power generation will be metered for each turbine and at the substation. Dan Boyd, RES Americas, responded directly to this comment at the Public Hearing and stated: ["It's [the royalties] usually a percentage of the whole Project, just so if one has a shutdown for a while somebody doesn't get the bad deal" The Public Hearing Transcript from the March 2, 2016, public hearing in the Town of Villenova is included in this FEIS as part of Appendix T, Public Participation
SDEIS-0015-70	Chuck Luce	Are any of the local people going to be involved in the construction?	Ball Hill has committed to hiring local construction and operation workers to the maximum extent practicable.
SDEIS-0015-74	Angeal Hughes	Are you saying that it's going to bring more local jobs? I'm really for it even more, so -- and I do have to add, I love our community, Chautauqua County. I was born, raised, went into the military, paid my taxes to Chautauqua County while I did my twenty years and I came back, bought a place, put a lot of money into this town of my own, just to fix up a place that was falling down. And I love this town. And I'm really -- I agree with you. We've got to look for the youth. We have to. And we need to look -- if we can get a few jobs here that's fabulous.	Construction of the Project would result in direct employment of up to 64-full-time equivalent employees of electrical workers, crane operators, equipment operators, and other construction workers and create up to approximately 320 additional indirect and induced full-time equivalent jobs region-wide. Once built, the wind turbines and associated components operate in almost a completely automated fashion. The Project will, however, permanently employ up to six on-site full-time equivalent technicians. Ball Hill has committed to hiring local construction and operation workers to the maximum extent practicable. For additional details see Section 2.13, Socioeconomics, of the 2016 SDEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Biological Resources			
SDEIS-0003-13	Department of Environmental Conservation	2.5 Biological Resources Section 2.5.1 Construction Impacts-Upland Vegetation This section erroneously states that Section 2.2 discusses Biological Resources and this should be changed to "Soils."	There was a typographical error in the SDEIS stating that Biological Resources was Section 2.2. In the SDEIS impacts associated with Biological Resources was summarized in Section 2.5. In the FEIS, updates to the impacts on biological resources can be found in Section 1.4.5.
SDEIS-0003-14	Department of Environmental Conservation	Table 2.5-1 provides a detailed description of expected impacts to various habitat types in the Project area. This section indicates that a large portion of the Project area is forested, particularly in the southern areas, and the habitat fragmentation due to construction of the Project is described as "minor in comparison with the overall acreage of forested land within the Project Area." NYSDEC staff notes that the dominant cover type within the Project footprint and surrounding area is forest and more than half of the turbines are currently proposed to be built in these forested areas. Table 2.5-1 indicates that a total of 155.6 acres of forest would incur temporary impacts and 81.5 acres would sustain permanent impacts. NYSDEC staff considers the clearing of all forested habitat to be a permanent impact due to the time it takes a forest to regenerate to pre-construction conditions. The applicant should amend Table 2.5-1 and all other vegetation impact analyses to reflect that the construction and operation of the Project will result in 155.6 acres of permanent loss of forest.	The impacts on forested land from the Project have been updated in the FEIS per the new Project layout. As noted by NYSDEC, all impacts on forested land should be considered permanent. Ball Hill engaged in a process of micro siting and analyzing engineering options and controls in order to minimize or avoid the Project's environmental impacts identified in the January 2016 SDEIS. Turbines were relocated and/or dropped to decrease impacts on forested lands. In the SDEIS, 155.6 acres of forested habitat was determined to be permanently impacted. In the updated layout presented in this FEIS (see Section 1.4.5) a total of 118.9 acres of forested land would be permanently impacted by the Project.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-15	Department of Environmental Conservation	Although the shrubby young forest may provide valuable habitat to a suite of bird species after clearing, the forest interior species that depend on contiguous forest will be negatively impacted by the loss of cover and habitat fragmentation caused by turbines, roads, and other infrastructure. Any contiguous forest block of 150 acres or larger is valuable forest habitat-viable for many bird species that require interior forests for breeding. Most of these species are protected by federal and State laws such as the Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), Part 182 of New York Codes, Rules and Regulations (NYCRR), and Article 11 of the NYSE CL.	A habitat fragmentation analysis looking at direct and indirect impacts to "valuable" forested habitat has been conducted for the Project, the results of which are detailed in Section 1.4.5, Biological Resources, and 1.4.16, Cumulative Impacts. The analysis was conducted using guidelines presented in "NYSDEC direct and indirect impacts to interior wildlife species" and has been conducted following the NYSDEC documented titled *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects*, June 2016. The analysis found there are 12 blocks of forested land greater than 150 acres. The Project would impact 118.9 acres of forested land in total, and would increase the number of forest blocks greater than 150 acres to 15 and would cut one forest block into a size smaller than 150 acres. More details can be found in Section 1.4.5 of this FEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-16	Department of Environmental Conservation	The applicant should consider layout design and factors to minimize impacts to forest interior breeding birds and bats and to mitigate for unavoidable forest clearing. These may include but are not limited to, placing turbines as close as possible to forest/field edges to reduce impact to both habitat types, conducting all tree clearing outside of the primary bird nesting season (April 1-August 31) and bat emergence, roosting and swarming period (April 1-0ctober 31); and communicating with NYSDEC and USFWS about options to mitigate for direct and indirect loss of forest interior habitat.	Ball Hill engaged in a process of micrositing and analyzing engineering options and controls in order to minimize or avoid the Project's environmental impacts identified in the January 2016 SDEIS. Turbines were placed closer to forest/field edges where possible to reduce impact to both habitat types (such as Turbine 2 and 21). Table 1.3-2 in the FEIS identifies how turbines were re-sited from the SDEIS to the FEIS. Tree clearing will be conducted between November 1 and March 31 to avoid impacts during the bat emergence, roosting, and swarming period. This range also minimizes potential impacts on birds since these dates are beyond the primary bird nesting season. Ball Hill is also preparing a BBCS in coordination with NYSDEC and the USFWS that will apply BMPs and other features to minimize potential impacts on these resources during construction and operation of the Project.
SDEIS-0003-42	Department of Environmental Conservation	An acceptable invasive species plan must detail survey methods to identify existing invasive species, listed in NYSDEC regulations found at 6 NYCRR Part 575, in the Project area to ensure that these areas can be avoided. At a minimum, the plan must: • Specify the method used to ensure that imported fill and fill leaving the site will be free of invasive species to the extent practicable, and whether fill within the site will either be free of invasive or only used within the area infested with the same invasive species; • Address how site grading and erosion and sediment control will work together to prevent invasive; • Detail all cleaning procedures to remove invasive species from equipment, preferably with a power-washer, including personnel, location of designated equipment cleaning stations, location of off-site disposal (if the material is not ren-	An updated invasive species management plan (ISMP) was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		dered incapable of growth or reproduction) which must be either a landfill, incinerator or State-approved disposal facility. The procedures must ensure that the equipment will arrive and leave the site clean and all equipment and clothing-cleaning stations must be constructed so that invasive species seeds are removed • Describe the Best Management Practices or procedures that will be implemented to ensure that Project activities do not result in introduction or spread of. invasive species, especially in or near regulated areas of special interest to NYSDEC Natural Resources staff such as areas containing protected species or habitats within the Project area; Provide measures for educating workers about invasive species and how to prevent their spread, identify work areas which trigger cleaning activities (such as prior to using mats in streams and wetland and wetland adjacent areas) and identify methods to prevent and control the transport of invasive species as well as how to clean equipment and clothing using acceptable methods; List all planting and seeding materials to be used; Detail post-construction monitoring and survey approaches, preferably for at least 5 years, which would ensure that the objective of no net increase in invasive species was accomplished . If areal coverage of invasive species in the ROW Project area increases over the baseline survey level, remedial action should be considered in consultation with NYSDEC and USACE. If the goals of the invasive species control plan are not met within five years post-construction, a revised control plan containing additional control actions for an additional monitoring term must be submitted.	

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-43	Department of Environmental Conservation	A major shortfall of the proposed ISMP limits survey work and area of concern to NYSDEC jurisdictional areas. The ISMP should extend to the whole Project area involving soil disturbance such as access roads, collection lines, staging/laydown areas, and all turbine sites. Pre-construction surveys of the entire Project corridor (in addition to wetlands and riparian areas) should be conducted to document infestations of invasive species that should be contained.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-44	Department of Environmental Conservation	The Plan should include employee/staff invasive species training.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-45	Department of Environmental Conservation	References to "post-construction surveys" of the area for invasive species should be changed to post-restoration surveys. In other words, surveys should be scheduled from the point that restoration is complete - not from when construction ends.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-46	Department of Environmental Conservation	"Comprehensive surveys" of the area should be extended to the whole Project area (to include upland areas) and specifically target garlic mustard in addition to the other species listed. Areas of infestation should be mapped using GPS and coordinates included in the survey report- along with a GPS shapefile. The shapefile of infested areas will be included on construction drawings - where applicable.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-47	Department of Environmental Conservation	References to the Federal and NYSDEC regulated wetlands, riparian areas, and NYSDEC adjacent areas (FORA) should be changed to "Project site" in all references in the document.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-48	Department of Environmental Conservation	BMPs should be used to clean equipment, etc. when leaving an infested area in order to prevent spread to non-infested areas.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-49	Department of Environmental Conservation	BMP 2 "Inspection of Fill Sources", fill sources should be from certified weed free facilities only.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-50	Department of Environmental Conservation	8) BMP 3, "Coordination with Agencies", the phrase, "all chemical treatments will be undertaken ..... " should be changed to "all chemical treatments will be applied .... " And "removal of topsoil to a depth of 16 inches ... " should be changed to "removal of topsoil to a depth of three feet. ... " When Japanese knotweed is concerned. References to "infected" should be changed to "infested ... " and infested soil should be only disposed of in a certified sanitary landfill - not in upland areas. Eurasian milfoil is not the only plant that should be removed by hand and placed into 3-mm thick black containers but also phragmites, garlic mustard, Japanese knotweed, and purple loosestrife.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-51	Department of Environmental Conservation	9) Post-construction surveys should extend to the entire Project site and cover crops should be non-invasive. As mentioned above "infection" should be replaced with "infestation" and "undertaken" should be replaced with "applied." Annual rye should be defined as "Lolium perenne".	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-52	Department of Environmental Conservation	10) BMP 4 "Equipment Sanitation", the sentence "Earth moving and excavation equipment used in an FORA where invasive species are present will be cleaned free of debris and soil within an upland area near the infected area prior to the removal of the equipment from the FORA" should be changed to read "Earth moving and excavation equipment used where invasive species are present will be cleaned free of debris and soil prior to moving the equipment to an uninfested area."	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-53	Department of Environmental Conservation	11)BMP 5, "Restoration", the term "FORA" should be replaced with "Project site" as mentioned above. The second sentence should read "An appropriate seed mixture shall be used." An upland seed mix should be defined as is the wetland seed mix.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-54	Department of Environmental Conservation	12)BMP 6, "Restoration Monitoring", the applicant should provide the NYSOEC with annual monitoring reports and FORA should be replaced with "Project site."	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-55	Department of Environmental Conservation	13) BMPs 8 and 9, the term "areal" should be replaced with "aerial". And - as should all references in the document, FORA should be replaced with "Project site." Post-construction should be replaced with post-restoration. The last sentence of Condition 9 should read "If the goal of this ISMP is not met within the first two years of post-restoration monitoring, Ball Hill will review its control efforts with NYSOEC and USACE, submit a revised ISMP plan, and implement applicable control actions and an additional monitoring term."	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0005-3	Marlene McNeight	The noise alone would be deafening and intolerable, let alone the damage to the countryside and to the animals.	All forms of energy generation have some level of impacts to wildlife. Potential impacts from this Project on wildlife and biological resources were described in detail in Section 2.5 and 2.6 of the SDEIS and are updated in Section 1.4.5, Section 1.4.6, and supporting appendices in this FEIS for the new Project layout.
SDEIS-0008-2	Charles Leone	They are an eyesore and a danger to wildlife. I strongly oppose going forward with their construction.	All forms of energy generation have some level of impacts on wildlife. Potential impacts from this Project on wildlife and biological resources were described in detail in Section 2.5 and 2.6 of the SDEIS and are updated in Section 1.4.5, Section 1.4.6, and supporting appendices in this FEIS for the new Project layout.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0010-3	Jonathan Titus	2. Our property in Villenova is subjected to constant invasions by non-native invasive species, which we have to pull so that the woods do not become completely overrun. These non-native species are spreading due to dispersal along roads often by construction vehicles. The invasive species appendix of the EIS is insufficient in that no mechanism is proposed to stop the spread of invasive species which will occur along the access roads during and after the construction process. Cleaning the construction vehicles will help but the invasive species will spread along the roads and into the nearby woods, regardless. The invasive species section is also out of date having been written in 2008. New data and an updated analysis are needed.	Appendix S, Environmental Monitoring Plan, of the FEIS includes an updated ISMP. The ISMP describes the BMPs Ball Hill will implement to ensure that its activities do not increase the presence of the invasive species within the Project Site. The goal of Ball Hill's invasive species management efforts will be to prevent the introduction and spread of invasive species listed above to new locations resulting from Project activities within the Project site and a 0% net increase in the areal coverage of invasive species resulting from Project activities within the limits of the Project site for two years post-restoration. For more details on the Project ISMP, see Appendix 13 within Appendix S of this FEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0010-4	Jonathan Titus	3. The bird surveys detected some important grassland bird species such as bobolinks, savanna sparrows and one grasshopper sparrow to name a few. The most recent survey was 5 years ago in 2011. In section 2.12.2.2 " Potential Impacts on Breeding Birds" the EIS states that impacts on breeding birds will be minimal, however, no evidence is presented as to why this is the case. Likewise in the next few sections impacts to raptors and bats are minimized. These sections need current data and evidence to support these statements.	Ball Hill conducted another breeding bird study in June 2016 and the results are included in the FEIS in Appendix H, Bird and Bat Resources. Bobolink and Savannah Sparrow are two of the more common species breeding in grassland habitats in the Project Area, while Grasshopper Sparrow is present in low numbers, which is consistent with the occurrence of these species in western New York. Grasshopper Sparrow sightings are discussed in more detail in the Breeding Bird Study report (see Appendix H). Additionally, a second year of eagle surveys was initiated and the results to date are included in the FEIS in Appendix H, Bird and Bat Resources. Impact to birds from wind projects in New York and elsewhere has largely been through collisions of nocturnal migrants in fall and to a lesser extent during spring migration. Avian collisions occur over a broad range of species with typically only one or a few of each individual in a given year. The potential impacts on other birds and to bats were discussed in the SDEIS and updated in the FEIS in Section 1.4.6 and Appendix H, Bird and Bat Resources. Ball Hill Wind is also preparing a BBCS in coordination with NYSDEC and the USFWS that will apply BMPs and other features to minimize potential impacts on these resources.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0010-6	Jonathan Titus	The species lists on the wetland data sheets are incomplete as is stated in the appendix. It is clear that the work was conducted outside of the growing season and the plant lists on the wetland data sheets are lacking in detail. To adequately assess wetland impacts and plan appropriate mitigation measures more data from growing season wetland assessments is needed. The mitigation plan proposed in the EIS is not adequate.	While it is acknowledged that delineations occurred outside of the growing season in the fall of 2015, the information contained on the datasheets is complete and accurate. Species data collected was adequate to both determine if an area met the criteria for delineation as a wetland and to inform the determination of the wetland cover type (e.g., scrub-shrub, emergent, and forested). This information is used to assess the type of impacts and resultant mitigation that may be required. These delineations were supplemented in 2016 during the growing season and were field verified by the New York State Department of Environmental Conservation (NYSDEC) and the United States Army Corps of Engineers (USACE). Appendix E, Water Quality and Wetlands, of this FEIS provides details of the results of the delineation. A conceptual wetland mitigation plan is provided in this FEIS as Appendix F. This plan describes Ball Hill's planned approach for mitigating Project-related impacts. It includes both direct mitigation (in the form of wetland restoration/enhancement) and purchase of mitigation credits through an in-lieu fee program. As part of the Project's Joint Application for Permit, a final mitigation strategy will be implemented in consultation with NYSDEC and the USACE.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0011-3	Priscilla Titus	This modified project comprises the construction and operation of 36 wind turbines, each of which is nearly 500 feet tall, in an area that is rural in nature and not appropriate for a project of this magnitude. The invasive species management plan needs to be updated to reflect the spread and introduction of additional invasive species in the area since the time of the 2008 survey, and adaptive management plans for the maintenance roads and the areas around the structures should be developed.	Appendix S, Environmental Monitoring Plan, of the FEIS includes an updated ISMP. The ISMP describes the BMPs Ball Hill will implement to ensure that its activities do not increase the presence of the invasive species within the Project Site. The goal of Ball Hill's invasive species management efforts will be to prevent the introduction and spread of invasive species listed above to new locations resulting from Project activities within the Project site and a 0% net increase in the areal coverage of invasive species resulting from Project activities within the limits of the Project site for two years post-restoration. For more details on the Project ISMP, see Appendix 13 within Appendix S of this FEIS.
SDEIS-0011-7	Priscilla Titus	Adverse impacts to wildlife including birds and bats is inadequately addressed because it does not take into account the effects of habitat degradation and fragmentation and the effects of noise and visual disturbances including those involved in maintenance.	Ball Hill Wind took many factors into consideration when updating the layout and reducing the number of turbines to 29 for this Project. The forest clearing and habitat fragmentation values are updated and discussed in Section 1 of the FEIS. Ball Hill Wind is preparing a BBCS that will include BMPs to reduce potential impacts during construction and operation.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0013-1	Jonathan Townsend	Habitat fragmentation, while admittedly is less of an issue for bats as opposed to birds or other organisms, will still result in a net loss of roosting habitat or direct loss of roosts through clearing of forests to put in access roads or transmission lines. It will also result in bat fatalities, stress on bat populations through construction activities, and a change in the landscape that will have an impact on the bat populations found there. Yes, bats do often forage in open areas in the canopy, and yes this project will create such openings. However, forests in the County are already fragmented, and there are no lack of forest clearings for bats to exploit.	Ball Hill Wind took many factors into consideration when updating the layout and reducing the number of turbines to 29 for this Project. The forest clearing and habitat fragmentation values are updated and discussed in Section 1 of the FEIS. Only one forest block greater than 150 acres will be fragmented and the amount of clearing is only 2.3% of the available forest in the area. Northern long-eared bat was identified in very low numbers in 2012 and 2015 in the area. Ball Hill Wind is preparing a BBCS that will include BMPs that will likely eliminate potential impacts on this species during operation.
SDEIS-0013-2	Jonathan Townsend	There IS a lack of contiguous mature forest for roosting habitat, which is exactly the type of habitat that species such as the northern long eared bat utilize. As you may know, the northern long eared bat is a species that was recently listed as "Threatened" by the USFWS, and from bat surveys associated with this project has been deemed likely to be living within the project area. Additionally, bats can travel well over 10 miles in an evening while out foraging, so there is the potential to impact bat populations not surveyed for or quantified in the SDEIS.	There have been multiple bat studies at this site as well as similar results from studies at nearby proposed wind projects. The greatest potential of impacts on bats is through collisions with turbines. This most often occurs in the late summer and early fall time period. Ball Hill is coordinating with NYSDEC regarding BMPs during this period as part of a BBCS. The impact on bats will be greatly reduced through implementation of these BMPs.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0014-5	Judy Phillips	Construction and operation of this project would cause damaging, irreversible, wildlife and plant habitat fragmentation, considerable long term environmental and major negative visual impacts to our rural community.	A habitat fragmentation analysis looking at direct and indirect impacts to "valuable" forested habitat, as defined by NYSDEC, has been conducted for the Project, the results of which are detailed in Section 1.4.5, Biological Resources, and 1.4.16, Cumulative Impacts. The analysis was conducted using guidelines presented in "NYSDEC direct and indirect impacts to interior wildlife species" and has been conducted following the NYSDEC documented titled *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects*, June 2016. The analysis found there are 12 blocks of forested land greater than 150 acres in size. The Project would impact 118.9 acres of forested land in total, and would increase the number of forest blocks greater than 150 acres to 15 and would cut one forest block into a size smaller than 150 acres. More details are presented in Section 1.4.5 of this FEIS. A VRA (see Appendix I of this FEIS) was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and cumulatively with other proposed wind energy projects. The VRA was prepared according to NYSDEC Program Policy "Assessing and Mitigating Visual Impacts" (NYSDEC 2000) (DEC Visual Policy) and SEQRA criteria to minimize impacts on visual resources. Section 1.4.7 and Appendix I of this FEIS provide a thorough review of potential visual impacts as compared to the layout presented in the SDEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-3	Tina Graziano	Not only will we constantly have this in our face, I have to observe every turbine killing and maiming our wildlife. I counted twenty-two turbines all around wet spots. What are you thinking? There's nothing on these turbines about the bats.	Less than 1 acre of wetlands is expected to be permanently filled by the Project. Wet areas within the Project are identified in detail in Appendix E of this FEIS, Wetland and Waterbodies. Ball Hill worked diligently to avoid wetland areas and minimize impacts on these areas. Ball Hill also sited turbines with the intent to minimize impacts on wildlife and the environment. Section 1.4.5 and 1.4.6 of the FEIS identifies the potential environmental impacts from the Project on wildlife and biological resources.
SDEIS-0015-16	Howard Crowell	I remember reading one of the Burke Hill studies back then and the list of priority on what killed the birds, the automobile and the birds of prey, and the last thing the front of your house and all that stuff right down through there, your neighborhood kid with a BB gun, you get down about ten, twelfth place, about one or two percent of your bird kills that's where the windmills is. There's stuff killing birds long before any windmills kill birds.	Please refer to Section 1.4.6 and Appendix H, Bird and Bat Resources, of this FEIS for a detailed assessment of potential impacts on birds.
Water Quality and Wetlands			
SDEIS-0001-3	Public Service Commission	Likewise, discussion of the transmission facility Article VII permitting for protected stream crossings should reference NYSPSC rather than NYSDEC permitting (SDEIS pp. 2.5-10; 2.5-14 and -15; and 3-1).	Please see Response to SDEIS-0001-1, above.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0001-4	Public Service Commission	At page 1-17, the SDEIS states that "underground collection lines would be installed via trenching or using a directional bore at stream locations. Streams that are not normally dry at the time of crossing would be temporarily dammed, and water would be pumped around the construction area to allow collection lines to be installed in dry conditions. The equipment that would be used to install the collection lines cuts a trench, places the cable, and backfills the trench in a single pass, thereby reducing the duration of stream disturbance. If directional boring machine is used, a horizontal boring machine will install a bore sufficiently below the bed, and cables will be pulled back in the bore." DPS recommends that trenching machines not cross significantly classed streams (including classes C(T) and above and any intermediate waterbodies greater than 10 feet). Instead, during dam and pump around or similar installation methods, proper erosion control devices should be placed along the stream bank; the trench can then be excavated from either side of the control measures.	As discussed in Section 1.3.3 of this FEIS, underground collection lines would be installed via trenching or using a directional bore at stream crossings. Boring (and not dam and pump methods) will occur for stream crossings where required by permit condition or where specific site conditions (e.g. protected streams, steep slopes, unstable soils or other engineering challenges) necessitate its use." If directional bore is used, a horizontal boring machine will install a bore sufficiently below the bed, and cables will be pulled back in the bore. Each bore will start and finish beyond stream banks. Aboveground junction boxes will be located at various locations to join multiple reels of cables for long runs and at one end of each directional bore location.
SDEIS-0003-2	Department of Environmental Conservation	2.3 Water Quality Section 2.3.1 Construction Impacts A detailed discussion of each individual stream crossing is required to demonstrate that the proposed construction impacts could not be avoided or further minimized. An elaboration of the specific and necessary impacts would allow NYSDEC to weigh costs and benefits in our SEQR Findings. As part of this process, photos and plans for the access road crossing and buried collection line crossing sites are essential and site visits by NYSDEC staff to examine the crossings may be required.	Discussions and crossing details for specific stream crossings as well as associated avoidance and minimization measures will be provided in the Joint Application for Permit package. The wetland delineation report (included in this FEIS in Appendix E, Water Quality and Wetlands) contains photos of the streams delineated within the Project Area. A site visit with Region 9 staff was conducted on September 14, 2016.
SDEIS-0003-3	Department of Environmental Conservation	In general terms, permanent roads will require bridges or culverts. If the crossings are temporary, a timber mat or other temporary equipment crossing is acceptable. No inwater crossings will be allowed such that equipment cannot be driven through streams unless the work is performed in dry conditions.	Comment noted. All permanent roads will be designed with appropriately sized culverts or will utilize existing culverted crossings.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-4	Department of Environmental Conservation	With respect to stream crossings, the applicant shall abide by our document "Stream Crossings: Guidelines and Best Management Practices" found at http://www.dec.ny.gov/permits/49066.html. Stream crossings should be designed to protect stream continuity. All crossings of class C(T) or higher streams should be completed using temporary or permanent crossing structures. The use of bridges is preferred over culverts, however, if culverts are used, they must meet the guidelines referenced above. Likewise, if NYSDEC regulated streams are impacted, the Project must meet standards established by NYSECL Article 15 (Protection of Waters) unless directional drilling is used to avoid all disturbance to the bed or banks of protected streams. If buried collection lines are to be placed by trench method, the work area must be isolated by damming and pumping, or similar method, and the work must be performed in dry conditions.	Comment noted. Ball Hill will abide by the NYSDEC document *Stream Crossings: Guidelines and Best Management Practices*.
SDEIS-0003-5	Department of Environmental Conservation	2.4 Wetlands Section 2.4 Delineated Wetlands Regional NYSDEC staff conducted field verification site visits in 2008 and 2012 for previous Project delineations. However, the jurisdictional determinations associated with these site visits were either not finished or have expired. These "historic" delineations must be re-visited and updated where needed and combined with new delineation information before submission to NYSDEC for updated field verification. The delineation report should also include delineation shapefiles	Revised wetland delineations have been conducted for the entire Project Area. As noted in Appendix C of the SDEIS, wetland delineations were not fully completed in 2015. As planned, delineations were completed in 2016 for the Project Site. Appendix E, Water Quality and Wetlands, of this FEIS provides details of the results of the delineation. A field verification was conducted with NYSDEC Region 9 staff on September 14, 2016. In addition, shapefiles were provided to NYSDEC as part of the submittal of the Wetland and Waterbodies Report for the Project.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-6	Department of Environmental Conservation	The potential for unmapped wetlands that meet State jurisdictional criteria must be evaluated. For example, a wetland found to be >12.4 acres or otherwise meeting State criteria for jurisdiction, is a NYDDEC regulated wetland. Further, any delineated wetland found to be part of the same wetland complex as a currently mapped State jurisdictional wetland is also regulated. Thus, NYSDEC regional staff must validate all wetland delineations	NYSDEC staff attended a field visit to the Project Area on September 14, 2016. While no additional unmapped state jurisdictional wetlands were identified, the boundaries of Freshwater Wetland (FWW) SC-12 and SC-13 were expanded to reflect additional areas delineated adjacent to the mapped boundaries.
SDEIS-0003-7	Department of Environmental Conservation	Section 2.4-1 Construction Impacts Upon field verification, confirmation of NYSDEC jurisdiction of wetlands, and additional avoidance and minimization measures, calculations of impacts such as in Table 2.4-2 should be updated and included in the FEIS. Impacts to NYSDEC wetlands must be explained including why each impact could not be avoided and how impacts have been minimized.	Temporary and permanent impacts on wetlands from construction and operation of the Project have been updated to reflect the current wetland delineations and Project layout, see Tables E.2-1 through E.2-3 in Appendix E, Water Quality and Wetlands, of this FEIS for more details. Resource specific avoidance and minimization discussions will be provided in the Joint Application for Permit.
SDEIS-0003-8	Department of Environmental Conservation	Under NYSDEC policy, wetland impacts are not permitted, even with mitigation, until other alternatives have been explored, including avoidance, minimization or reduction of impacts. Generally, applicants are required to examine alternative project designs that avoid and reduce impacts to wetlands, develop plans to create or improve wetlands or wetland functions to compensate for unavoidable impacts to wetlands, and demonstrate overriding economic and social needs for the project that outweigh the environmental costs of impacts on the wetlands.	An alternatives analysis discussion relative to the Ball Hill Wind Project was provided in Section 1.3 of the SDEIS. A site-specific alternatives analysis relative to the transmission line crossing of FWW SC-12 and SC-13 will be presented in the Joint Application for Permit.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-9	Department of Environmental Conservation	DEC recommends that information regarding potential wetland impacts should be formatted such that wetland and adjacent area impacts are listed by wetland (including wetland name and agency jurisdiction) and include the type of impact (road, tower, transmission line, etc.). Preliminary plans of each area of impact which includes a written description of the impacts, both temporary and permanent, to the wetland and adjacent area must be provided. This description should also include the name, size and class of the wetland, the type of habitat impacted, the type and size of impact, a discussion of the restoration planned after construction, a justification of the impacts, and the steps taken for avoiding and minimizing these impacts.	Wetland impact details are included in Appendix E, Water Quality and Wetlands, of this FEIS.
SDEIS-0003-10	Department of Environmental Conservation	Moreover, when developing the Project plan, the Applicant must consult the following manual and guidelines: • "New York State Department of Environmental Conservation Wetland Delineation Manual (1995)." The applicant should refer to DEC's Wetland Delineation Manual when delineating freshwater wetlands regulated under 6 New York Codes Rules and Regulations (NYCRR) Part 624 (Freshwater Wetlands).1 • "Wetlands Regulation Guidelines on Compensatory Mitigation (1993)." If unavoidable wetland impacts are expected to result from project construction activities, compensatory mitigation may be required to demonstrate compliance with the 6 NYCRR Part 624. Proposed mitigation should conform to DEC wetland mitigation guidelines2	The Project consulted the New York State Department of Environmental Conservation Wetland Delineation Manual (1995) when delineating wetlands presented in Appendix E, Water Quality and Wetlands. The Project also consulted the *Wetlands Regulation Guidelines on Compensatory Mitigation* (1993) when developing proposed mitigation guidelines for the Project.
SDEIS-0003-11	Department of Environmental Conservation	Section 2.4-2 Operational Impacts Same comments as 2.4-1 , above	See response to comment SDEIS-0003-7.
SDEIS-0003-12	Department of Environmental Conservation	Section 2.4-3 Mitigation Mitigation for Permanent Impacts In addition to proposed USAGE mitigation, the SDEIS should also detail proposed NYSDEC mitigation.	The Conceptual Wetland Mitigation Plan included in Appendix F of this FEIS includes details on proposed mitigation for the impacts to NYSDEC Freshwater Wetland SC-12 and SC-13.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-38	Department of Environmental Conservation	Appendix C-Draft Progress Wetland Delineation Report Although Regional NYSDEC staff has conducted field verification site visits in 2008 and 2012 for previous delineations for the proposed Project, the jurisdictional determinations associated with these site visits were either not finished or have expired. These "historic" delineations must be re-visited, updated and combined with the new delineation information before submission to NYSDEC for updated field verification.	As noted in Appendix C of the SDEIS, wetland delineations were not fully completed in 2015. As planned, delineations were completed in 2016 for the Project Area. These delineations were field verified by NYSDEC and the USACE on August 24, 2016, and September 14, 2016, respectively. Appendix E, Water Quality and Wetlands, of this FEIS provides details of the results of the delineation.
SDEIS-0003-39	Department of Environmental Conservation	When the delineation report is submitted, NYSDEC requests updated Project and wetland delineation shapefiles.	Shapefiles of the delineated wetlands and streams have been provided to NYSDEC.
SDEIS-0003-40	Department of Environmental Conservation	Appendix E Stormwater Pollution Measures Before commencing construction activity, the applicant must obtain coverage under the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity. The SWPPP subject to the SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002) shall include Erosion and Sediment Controls designed, installed and maintained in accordance with the most current version of the "New York Standards and Specifications for Erosion and Sediment Control."	Prior to construction, Ball Hill will obtain coverage under the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002), which will include Erosion and Sediment Controls designed, installed and maintained in accordance with the most current version of the *New York Standards and Specifications for Erosion and Sediment Control*.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-41	Department of Environmental Conservation	Additionally, for projects that include the construction of permanent gravel access roads, the SWPPP shall include post-construction stormwater management practices designed in accordance with the most current version of the "New York State Stormwater Management Design Manual (Manual)" (see Table 2, Appendix B of GP-0-15-002). Chapter 4 of the Design Manual should be used to determine the minimum sizing criteria for these post-construction controls	Prior to construction, Ball Hill will develop a Stormwater Pollution Prevention Plan (SWPPP) designed in accordance with the most current version of the *New York State Stormwater Management Design Manual*. Prior to construction, Ball Hill will obtain coverage under the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002), which will include Erosion and Sediment Controls designed, installed, and maintained in accordance with the most current version of the *New York Standards and Specifications for Erosion and Sediment Control Manual* including Chapter 4 of the manual, which will be used to determine the minimum sizing criteria for post construction controls.
SDEIS-0003-43	Department of Environmental Conservation	1) A major shortfall of the proposed ISMP limits survey work and area of concern to NYSDEC jurisdictional areas. The ISMP should extend to the whole Project area involving soil disturbance such as access roads, collection lines, staging/laydown areas, and all turbine sites. Pre-construction surveys of the entire Project corridor (in addition to wetlands and riparian areas) should be conducted to document infestations of invasive species that should be contained.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.
SDEIS-0003-47	Department of Environmental Conservation	5) References to the Federal and NYSDEC regulated wetlands, riparian areas, and NYSDEC adjacent areas (FORA) should be changed to "Project site" in all references in the document.	An updated ISMP was prepared for the Project and addresses the topics covered by these comments. The updated ISMP is included in this FEIS as Appendix 13 within Appendix S, Environmental Monitoring Plan.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-56	Department of Environmental Conservation	Appendix J-Conceptual Wetland Mitigation Measures The applicant must work closely with NYSDEC and Army Corps of Engineers in developing appropriate mitigation with the understanding that mitigation is only an option after avoidance and minimization have been exhausted as possibilities.	Ball Hill has been in close contact with both NYSDEC and the USACE while developing the Conceptual Wetland Mitigation Plan provided in Appendix F of this FEIS. The final mitigation strategy will be dependent on availability of suitable land for Project implementation, availability of appropriate plant material, and the final impacts approved for the Project through the Joint Permit process with NYSDEC and the USACE. Ball Hill understands that mitigation is only allowable after consideration of avoidance of potential impacts and minimization of unavoidable impacts.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0010-6	Jonathan Titus	The species lists on the wetland data sheets are incomplete as is stated in the appendix. It is clear that the work was conducted outside of the growing season and the plant lists on the wetland data sheets are lacking in detail. To adequately assess wetland impacts and plan appropriate mitigation measures more data from growing season wetland assessments is needed. The mitigation plan proposed in the EIS is not adequate.	While it is acknowledged that delineations occurred outside of the growing season in the fall of 2015, the information contained on the datasheets is complete and accurate. Species data collected was adequate to both determine if an area met the criteria for delineation as a wetland and to inform the determination of the wetland cover type (e.g., scrub-shrub, emergent, and forested). This information is used to assess the type of impacts and resultant mitigation that may be required. These delineations were supplemented in 2016 during the growing season and were field verified by the New NYSDEC and the USACE. Appendix E, Water Quality and Wetlands, of this FEIS provides details of the results of the delineation. A conceptual wetland mitigation plan is provided in this FEIS as Appendix F. This plan describes Ball Hill's planned approach for mitigating Project-related impacts. It includes both direct mitigation (in the form of wetland restoration/enhancement) and purchase of mitigation credits through an in-lieu fee program. As part of the Project's Joint Application for Permit, a final mitigation strategy will be implemented in consultation with NYSDEC and the USACE.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0011-6	Priscilla Titus	The wetland analysis is incomplete.	As noted in Appendix C of the SDEIS, wetland delineations were not fully completed in 2015. As planned, delineations were completed in 2016 for the Project Site. These delineations were field verified by NYSDEC and the USACE on August 24, 2016, and September 14, 2016, respectively. Appendix E, Water Quality and Wetlands, of this FEIS provides details of the results of the delineation. In addition, between the publishing of the SDEIS and FEIS, Ball Hill has engaged in a process of micrositing and analyzing engineering options and controls in order to minimize or avoid the Project's environmental impacts identified in the SDEIS. Section E-2 in Appendix E, Water Quality and Wetlands, outlines the decrease in wetland impacts from development of the FEIS layout.
SDEIS-0015-76	Lisa Brain	Will this affect -- a lot of people have wells. Will that affect their wells at any cost, drilling, like you know, the water mains and stuff?	The Project will be designed to avoid all known underground features, such as lines to wells and drainage tiles. If any public or private lines or drainage tiles were disturbed during construction, Ball Hill would be responsible for repairing them.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Public Participation			
SDEIS-0005-1	Marlene McNeight	The Town Council of Villanova held a meeting with (RES), country unknown, without the knowledge of property owners in Villanova. Little is known about the meeting except that the RES would like to set up an industrial wind farm in Villanova with windmills being 500' tall having the span of 2 football fields.	The Lead Agency held a public hearing related to the Ball Hill Project on March 2, 2016. A transcript of the meeting was recorded, and responses are provided below in Section 2 to comments made during the meeting. Large wind turbines produced by Vestas, like the ones proposed for the Project, have been constructed at other wind farms in western New York and elsewhere in the United States. In addition, this FEIS presents turbine specification drawings of the proposed turbine. See Appendix B, Turbine Specifications, of this FEIS.
SDEIS-0005-6	Marlene McNeight	Why would the elected officials not be concerned about the people that elected them. This is definitely not in the interest of the property owners of Villanova but to all property owners of rural property.	Thank you for your comment.
SDEIS-0006-4	Greg Snow	Questions: Public access to information: We have made repeated attempts to download and view Appendix A volumes I, II and III, the downloads never finish and we keep getting "file is damaged and cannot be opened", why is this important information unavailable to the public? Why are the .pdfs of the SDEIS and appendices secured (locked) documents? This has made them extremely difficult for us to work with as we are unable to print and copy/paste these files.	The 2008 DEIS files are very large files (two files are larger than 300MB, and one file is larger than 175MB), such that it may be hard to download them. Print copies of the 2016 SDEIS were provided to the town offices in Villenova and Hanover to be made available for public review. The towns also retain print copies of the 2008 DEIS.
SDEIS-0006-12	Greg Snow	What is the process for filing complaints on noise problems? How can we be certain all complaints will be addressed and resolved?	The complaint resolution procedure proposed in the Project Application, will provide a mechanism for filing and resolving complaints about noise and other matters. The Host Community Agreement will address noise monitoring requirements during Project operations. The Complaint Resolution Plan is included in this FEIS as Appendix L.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0006-13	Greg Snow	Will a turbine be shut down during critical times (eg. overnight) if noise problems cannot be resolved?	If a turbine is determined to be non-compliant with applicable noise limits, and it cannot be corrected, it would be shut down as non-compliant.
SDEIS-0007-1	Christopher Warner	I am writing to express my frustration in supporting green energy, but being left out until the last minute in changes and size adjustments to an already very large change in our very rural land scape. As a result I must voice my strong opposition to the siting of extremely tall wind turbines on Ball Hill in the Town of Villenova unless some changes are put into place. My residence and farm is on Straight Road in the Town of Arkwright, less than 1.5 miles from turbine #2.	The public hearing and public comment period were scheduled after the SDEIS was submitted to the Lead Agncy and made available online and at public locations to give members of the public and government agencies an opportunity to comment on the Project. All comments were made available for review and consideration by the Lead Agency and the Project developer prior to preparation and submission of the FEIS and the Project application. An additional public hearing was held in Villenova on October 13, 2016, and likewise an additional public hearing will be held in Hanover during November 2016. Section 1 and Appendix A of the FEIS describe the final layout of turbine locations and other project facilities, including the final location for Turbine 2.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-12	Christopher Warner	I believe that a computer model should be created that can show every resident within a 10 mile radius of the Ball Hill Wind Project what the turbines will look like and sound like, when the turbines are in motion, from their actual property. I believe this kind of virtual reality model will help our impacted community better understand what it will be like living with tremendously large turbines, every minute of every day.	Ball Hill does not possess such a modeling tool. However, one purpose of the FEIS, of many, is to provide the Town Boards and community members with tools to understand what the Project will look and sound like once operational. Please refer to the following sections of this FEIS: Section 1 (Project Description) for a detailed description of the Project components; Appendix C, Project Drawings, for on the ground disturbance and construction plans; Appendix I, Visual Resource Assessment, for a description of the visual impacts from the project and photo simulations, which are provided to represent what the V126 wind turbine would look like from certain vantage points in the Towns of Hanover and Villenova; and Appendix J, Sound Level Assessment Report, for an impact analysis of the sound levels from operation of the Project.
SDEIS-0007-13	Christopher Warner	I work evenings and have been unable to attend community meetings so far. This doesn't mean I'm not very interested and I believe that in order for projects like this to be a success, the entire community should be involved and benefit. Project developers want to build turbines on the Chautauqua Ridge, the town has more negotiating power that it thinks.	Thank you for your comment.
SDEIS-0010-1	Jonathan Titus	I am writing this letter to express my concern with the Ball Hill Wind Energy Project. We are supporters of alternative energy projects, however, appropriate siting is critical to any project. My first concern is that even though we are taxpayers who own property in Villenova we only found out about the project a few days ago. We were then surprised to find out that the EIS public comment period ended today. Our property is adjacent to one of the project sites and I believe we should have found out about the project much earlier in the process. We then found it difficult to download sections of the EIS - it appears that some of the sections are corrupted. I urge you to	Prior to the March 2, 2016, public hearing in the Town of Villenova on the SDEIS, Ball Hill prepared a notice of public hearing (which also advised that written comments would be accepted by the Lead Agency up to and including March 14, 2016) that was published in the *Dunkirk Observer* as required under the Villenova Wind Law, and in the Environmental Notice Bulletin as required under SEQRA. Ball Hill also mailed notices of the Public Hearing to residents within the distance specified under the Villenova Wind Law. Ball Hill

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		please extend the public comment period and be sure that the EIS is easily accessible and neighbors notified.	appreciates that not all residents of Villenova or other parties interested in the Project may have received such notices, however, Ball Hill respectfully submits that it was not required or requested to provide Town-wide notice nor notice to residents outside Villenova. Ball Hill held additional public hearings in the Town of Villenova on October 13, 2016, and November 9, 2016, in the Town of Hanover in accordance with each Town's wind law. The notices for these public hearings are published in each town's official newspaper and mailed on behalf of each Town Board to all property owners within the proposed Wind Energy Overlay District, defined as being within a 500-foot buffer around the portion of the Project Area in the Town of Villenova and within a 1,500-foot buffer around the portion of the Project Area in the Town of Hanover, as specified by the corresponding Town Wind Law. The Notice for these hearings will specify the Project, its amended application, and requests for the adoption of a local law for the creation of a Wind Overlay District and a local law amending the provisions of the towns' wind laws to increase the maximum height restrictions to 495 feet.
SDEIS-0010-7	Jonathan Titus	Thank you for considering my comments. Please consider lengthening the comment period and increasing access to the EIS.	Thank you for your comments.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0011-1	Priscilla Titus	As a landowner in the Town of Villenova, I was dismayed to learn from a friend that the deadline for comments regarding the Ball Hill SDEIS was today. Our property lies within the project area and two structures are proposed within sight of our property. Although I live in the Village of Fredonia, the tax bill for our Villenova property always arrives on time. Why was no written notice sent regarding the comment period for this analysis? To further complicate my review of the analysis, I was unable to access Appendices Volumes I, II, and Ill of the DEIS from the website because the files are apparently corrupt; and, because I am recovering from surgery at this time, I am unable to travel to the Town offices in order to look at hard copies. I see no evidence that this project was listed in the NYS Department of Environmental Conservation's Environmental Notice Bulletin. Thus, I feel the public review process for this project is inadequate and the period for public review should be extended to a date not less than 90 days after a notice has been sent to every landowner in the project area describing the current analysis and avoiding detailed instructions that enable access to review documents.	Ball Hill prepared and distributed a public meeting announcement but appreciates that not all interested residents and parties were aware of the meeting. Fortunately, the resident property owner became aware of the public comment period and had the opportunity to provide comments.
SDEIS-0014-2	Judy Phillips	Many Villenova residents are not well informed about the details of the industrial Ball Hill Wind Project and how their involvement can affect it, the procedures and steps involved with its approval, host agreement and PILOT incentives, other agencies involved in the project, and the timelines and deadlines that influence the outcome.	Ball Hill prepared and distributed a public meeting announcement, print copies of the SDEIS and Amended Applications were provided to the Towns to make available for public review, and the Project documents were posted on a public website, but Ball Hill appreciates that not all interested residents and parties were aware of the public meeting or opportunity to comment. Fortunately quite a few comments were received, making it more likely that the most common and important concerns of community members have been expressed.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0014-3	Judy Phillips	For residents with the limited forms of access in our area to the internet, the slow download of the many appendixes is frustrating and may deter residents from reading about the project on the Ball Hill web site.	Print copies of the SDEIS were provided to the Towns to make available for public review.
SDEIS-0015-1	Tina Graziano	A lot of people I'm sure didn't even know this was available online or anything like that. That's kind of an issue I have right now. I would like to request another public hearing and have the deadline for written comments extended until after the next public hearing. The reason for this request is a lack of notification to the residents of this township. Town law states it only requires to place a legal notice in a local paper. Well, very few here received this paper, and even so, who looks in the legal notices? It all appears when you do it to be sneaky and private.	Ball Hill prepared and distributed a notice for the March 2, 2016, public hearing in the Town of Villenova, and public comments regarding the SDEIS were accepted until March 14, but Ball Hill appreciates that not all interested residents and parties became aware of the meeting or the opportunity to comment. Ball Hill respectfully submits that it was not required or requested to provide Town-wide notice nor notice to residents outside Villenova. Ball Hill held additional public hearings in the Town of Villenova on October 13, 2016, and November 9, 2016, in the Town of Hanover in accordance with each Town's wind law. The notices for these public hearings are published in each Town's official newspaper and mailed on behalf of each Town Board to all property owners within the proposed Wind Energy Overlay District, defined as being within a 500-foot buffer around the portion of the Project Area in the Town of Villenova and within a 1,500-foot buffer around the portion of the Project Area in the Town of Hanover, as specified by the corresponding Town Wind Law.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-8	Greg Snow	I heard her comment on notification and at the second meeting. I have to agree with that. Most of my neighbors I've spoken to received no notification, had no idea that this meeting was happening or that this project was even a thing. I believe we should have another meeting with proper notification for all other residents of the town.	Ball Hill prepared and distributed a notice for the March 2, 2016, public hearing in the Town of Villenova, and public comments regarding the SDEIS were accepted until March 14, but Ball Hill appreciates that not all interested residents and parties became aware of the meeting or the opportunity to comment. Ball Hill respectfully submits that it was not required or requested to provide Town-wide notice nor notice to residents outside Villenova. Ball Hill held an additional public hearing in the Town of Villenova on October 13, 2016, and November 9, 2016, in the Town of Hanover in accordance with each Town's wind law. The notices for these public hearings are published in each Town's official newspaper and mailed on behalf of each Town Board to all property owners within the proposed Wind Energy Overlay District, defined as being within a 500-foot buffer around the portion of the Project Area in the Town of Villenova and within a 1,500-foot buffer around the portion of the Project Area in the Town of Hanover, as specified by the corresponding Town Wind Law.
SDEIS-0015-10	Angela Hughes	And plus I'm saying I was down in North Carolina and I heard about this meeting and I know -- I seen it as well online because I was keeping up with this, so if I'm coming from North Carolina, so I have the other aspect. You could be right in what you're saying, but my issue is that if I heard it from North Carolina, why didn't the other people hear it?	Thank you for your comment.
SDEIS-0015-13	Angela Hughes	So I'm just for it. I am. And like I said, I can't stress enough, I was all the way down in North Carolina and I heard about the meeting.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-14	Richard Hagel	If she got it online there's a whole bunch of us old timers that don't even have a computer, so that puts us right out of that equation right there. I'm for it, by the way, but if it takes a computer to find out there's a meeting, there's a whole bunch of old farts like me that don't have a computer.	Thank you for your comment.
SDEIS-0015-19	Charlie Brecht	We knew about it in 2008, but we had no notification of this meeting at all tonight. So you know, we have a small piece of property. We only have five acres, but if it wouldn't have been for him we wouldn't be here. And I'm not saying for or against or anything like that, but I agree that the notification should go out to everybody that's -- that has to do with this project.	Ball Hill prepared and distributed a notice for the March 2, 2016, public hearing in the Town of Villenova, and public comments regarding the SDEIS were accepted until March 14, but Ball Hill appreciates that not all interested residents and parties became aware of the meeting or the opportunity to comment. Ball Hill respectfully submits that it was not required or requested to provide Town-wide notice nor notice to residents outside Villenova. Ball Hill held additional public hearings in the Town of Villenova on October 13, 2016, and November 9, 2016, in the Town of Hanover, in accordance with each Town's wind law. The notices for these public hearings are published in each Town's official newspaper and mailed on behalf of each Town Board to all property owners within the proposed Wind Energy Overlay District, defined as being within a 500-foot buffer around the portion of the Project Area in the Town of Villenova and within a 1,500-foot buffer around the portion of the Project Area in the Town of Hanover, as specified by the corresponding Town Wind Law.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-29	Lisa Brain	Also, we were never notified of this meeting. I only know about this going on because my neighbor who I work with, he's getting one on his property and so he was informing me of stuff as we went along. But no, I never received a letter or anything. And as everyone knows, computer service, Internet where we live is like near to impossible, so putting it on the Internet is not going to do nothing.	Ball Hill prepared and distributed a notice for the March 2, 2016, public hearing in the Town of Villenova, and public comments regarding the SDEIS were accepted until March 14, but Ball Hill appreciates that not all interested residents and parties became aware of the meeting or the opportunity to comment. Ball Hill respectfully submits that it was not required or requested to provide Town-wide notice nor notice to residents outside Villenova. Ball Hill held additional public hearings in the Town of Villenova on October 13, 2016, and November 9, 2016, in the Town of Hanover in accordance with each Town's wind law. The notices for these public hearings are published in each Town's official newspaper and mailed on behalf of each Town Board to all property owners within the proposed Wind Energy Overlay District, defined as being within a 500-foot buffer around the portion of the Project Area in the Town of Villenova and within a 1,500-foot buffer around the portion of the Project Area in the Town of Hanover, as specified by the corresponding Town Wind Law.
SDEIS-0015-31	Judy Phillips	I have a question for this company, because we were once landowners that were approached back in 2008 for leasing. Our family discussed this project when it fell through with Noble. I wasn't aware of it, but when I tried to reach representatives, because our family had more questions, we weren't able to.	With developments in turbine technology and with the continued development of the Project by Ball Hill in 2015, the layout of the Project has changed including negotiations with individual landowners. The final layout to the Project is outline in Section 1 of this FEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-35	Barry Nobles	I would agree with the letter thing. We only found out about it from hearing from my parents. We never received a letter.	Ball Hill prepared and distributed a notice for the March 2, 2016, public hearing in the Town of Villenova, and public comments regarding the SDEIS were accepted until March 14, but Ball Hill appreciates that not all interested residents and parties became aware of the meeting or the opportunity to comment. Ball Hill respectfully submits that it was not required or requested to provide Town-wide notice nor notice to residents outside Villenova. Ball Hill held additional public hearings in the Town of Villenova on October 13, 2016, and November 9, 2016, in the Town of Hanover in accordance with each Town's wind law. The notices for these public hearings are published in each Town's official newspaper and mailed on behalf of each Town Board to all property owners within the proposed Wind Energy Overlay District, defined as being within a 500-foot buffer around the portion of the Project Area in the Town of Villenova and within a 1,500-foot buffer around the portion of the Project Area in the Town of Hanover, as specified by the corresponding Town Wind Law.
SDEIS-0015-37	Barry Nobles	Another thing is I'm from a community that has a landfill and we have a host agreement with the landfill and from the landfill point of view management of that is very important and the company that does that does a very good job, but it's important for the community to understand what goes into that can see some of the benefits so that's a case where that does work well. It's a tough thing. I think it's really important when everybody can get the information everybody can look at it and get people that are willing to listen to that. I think energy independence is very important. I just try to push energy independence forward. We don't have to send people to the Middle East to try to get resources.	Ball Hill will enter into Host Community Agreements with the Towns of Villenova and Hanover that will be agreed to by Ball Hill and the Town Boards.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-51	Judy Phillips	Some Villenova residents own seasonal homes, other residents are snowbirds. They are not in our community at this time of year and would be unaware of this project or unable to attend this meeting.	Ball Hill prepared and distributed a notice for the March 2, 2016, public hearing in the Town of Villenova, and public comments regarding the SDEIS were accepted until March 14, but Ball Hill appreciates that not all interested residents and parties became aware of the meeting or the opportunity to comment. Ball Hill respectfully submits that it was not required or requested to provide Town-wide notice nor notice to residents outside Villenova. Ball Hill held an additional public hearing in the Town of Villenova on October 13, 2016, and November 9, 2016, in the Town of Hanover in accordance with each Town's wind law. The notices for these public hearings are published in each Town's official newspaper and mailed on behalf of each Town Board to all property owners within the proposed Wind Energy Overlay District, defined as being within a 500-foot buffer around the portion of the Project Area in the Town of Villenova and within a 1,500-foot buffer around the portion of the Project Area in the Town of Hanover, as specified by the corresponding Town Wind Law.
SDEIS-0015-52	Judy Phillips	Some Villenova residents own seasonal homes, other residents are snowbirds. They are not in our community at this time of year and would be unaware of this project or unable to attend this meeting.	Thank you for your comment.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Sound			
SDEIS-0001-9	Public Service Commission	Regarding discussion of facility Noise impacts, DPS previously identified operational noise of major electric substation equipment as having a potential significant impact. In comments on the DEIS submitted in November, 2008, DPS identified the need to assess tonal noise from transmission grade transformers. The SDEIS does not provide analysis of potential for tones from the substation. The substation analysis is based on "one MVA, 120 kV utility scale transformer" rather than a 230 kV transformer as now proposed for the Ball Hill Project (SDEIS, Appendix 0 , page 6-3, footnote 1 to table 6-7).	Epsilon Associates, Inc. developed a technical memo in response to sound comments received from the NYSPSC. This technical memo includes responses on tonal noise from transmission grade transformers and is attached to this FEIS in Appendix J, Sound Level Assessment Report.
SDEIS-0001-10	Public Service Commission	Furthermore, DPS considers that the sound power level estimates for the transformer need supporting information either by supplementing their derivation or by documenting with sound tests. Given the proximity of the 50 dBA noise contour line the likelihood of occurrence of a prominent tone should be analyzed as well as the potential to exceed local law limits or cause annoyance or complaints at closer noise sensitive receptors. Please see attached Appendix A for details.	Epsilon Associates, Inc. developed a technical memo in response to sound comments received from the NYSPSC. This technical memo includes responses on tonal noise from transmission grade transformers and is attached to this FEIS in Appendix J, Sound Level Assessment Report.
SDEIS-0001-15	Public Service Commission	Ball Hill Wind Project – Substation Noise Assessment	Epsilon Associates, Inc. developed a technical memo in response to sound comments received from the NYSPSC. This technical memo includes responses on all comments received as part of Appendix A of the NYSPSC comment letter on the 2016 SDEIS and is attached to this FEIS in Appendix J, Sound Level Assessment Report.
SDEIS-0005-2	Marlene McNeight	This [a turbine with the height of 500 feet]] has not been accepted anywhere else in the United States to our knowledge.	Large wind turbines produced by Vestas, like the ones proposed for the Project, have been constructed at other wind farms in New York (such as the Marble River Windfarm in Clinton and Ellenburg, New York) and elsewhere in the United States. In addition, this FEIS presents turbine specification drawings of the proposed turbine (see Appendix B, Turbine Specifications).

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0005-3	Marlene McNeight	The noise alone would be deafening and intolerable, let alone the damage to the countryside and to the animals.	As detailed in Appendix J, Sound Level Assessment Report, sound produced by the wind turbines may be audible at times, but would be far from "deafening," and within the sound-level limits approved by the Town of Villenova. For more details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report. In addition, all forms of energy generation have some level of impacts on wildlife. Potential impacts from this Project on wildlife and biological resources were described in detail in Section 2.5 and 2.6 of the SDEIS and are updated in Section 1.4.5, Section 1.4.6, and supporting appendices in this FEIS for the new Project layout.
SDEIS-0006-5	Greg Snow	Sound and vibration: Our area is extremely quiet and our average sound levels, especially at night, are far below those typically encountered in most suburban and rural areas. Was this reality actually measured here and taken into account when calculating the sonic impacts?	Yes, ambient sound levels were measured in the proposed Project Area at six locations by Hessler Associates in 2008. NYSDEC guidelines specify that increases in noise levels 3 to 6 dB above ambient may have potential for adverse noise impact only in cases where the most sensitive of receptors are present. Sound modelling for the Project demonstrates that ambient levels in the Project Area would not increase more than 6 dB as a result of sound produced by the proposed wind turbines. For additional details of the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0006-6	Greg Snow	What are the very low frequency and subsonic sound emissions (1 to 31.5Hz) of the proposed turbines at most critical wind speed?	As shown in Table 7-3 of Appendix J, Sound Level Assessment Report, the predicted maximum levels of Project sound at 31.5 Hz at the 10 highest modeling receptors are all 63 dB or lower - well below the 74 dB level prescribed by the noise criterion established for private home interiors by NC-30, and the 71 dB equivalent level for moderately perceptible vibration and rattle (see Appendix J, p. 7-4). For additional details of the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.
SDEIS-0006-7	Greg Snow	Since low frequency noise is a primary problem with wind turbines and the most difficult to mitigate, why was C weighting or very low frequency data not used in the modeling?	As discussed on page 7-2 of Appendix J, Sound Level Assessment Report, for the Vestas V126-3.45 turbine, the maximum C-weighted sound level at any of the modeling receptors is predicted to be less than or equal to 63 dB, less than applicable problem thresholds.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0006-8	Greg Snow	Please detail sound measurement methodology employed by the turbine manufacturers, this information is not on their web-sites or addressed in the SD EIS.	The procedures of the standard IEC 61400-11 *Wind Turbine Generator Systems – Part 11: Acoustic Noise Measurement Techniques* are used by all wind turbine manufacturers to measure sound levels from their wind turbines. This standard provides a technique to measure sound power level information on broadband (A-weighted), octave band, one-third octave band, and tonality under a variety of wind conditions. For each wind turbine selected, a microphone is mounted according to IEC 61400-11 on a circular, flat hard board "ground board" a horizontal distance Ro of (H + D/2) meters from the wind turbine vertical centerline. H is the vertical distance from the ground to the turbine rotor center, and D is the diameter of the rotor. The microphone is mounted on a groundboard in order to have uniform reflections from the board at all frequencies and since wind at the surface is lower than elevated. The microphone is equipped with one-half of a 7-inch wind screen to reduce the effect of wind noise including low frequency wind noise. For additional details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0006-9	Greg Snow	Per the noise study, where can we find the "modeling receptor ID#" applicable to our home so we can determine who is in the top "worst case for low frequency sound levels"?	Based on the address provided as part of the comment letter, the Receptor ID #269 for the commenter is #269. As shown on Table 7-3 of Appendix J, Sound Level Assessment Report, Receptor ID #269 is not in the top 10 of the Predicted Worst-Case Low Frequency Sound Levels. Receptor ID #269 would experience lower levels than presented on Table 7-3 of Appendix J since the receptor is farther away from Project facilities. In addition, the worst-case sound level for this receptor is 33 dBA (L10) and 32 dBA (Leq) (see Table A-1 in Appendix J, Sound Level Assessment Report).
SDEIS-0006-10	Greg Snow	The GE 2.3-116 turbines have a "low noise trailing edge technology" option, if these turbines are selected will the low noise option be included and installed on all turbines?	The GE turbine formerly under consideration has not been selected, but the Sound Level Assessment Report details the V126 turbine's compliance with all applicable noise limits and guidelines, see Appendix J, Sound Level Assessment Report.
SDEIS-0006-11	Greg Snow	Since all machinery produces vibrations and the turbine's generator, transmission, bearings and blade vibrations and imbalances will produce vibrations that will be transmitted into and through the ground, where is the study that addresses this issue applicable to local stratum?	Under normal operation, there is no perceptible vibration from a wind turbine at these setback distances. In addition, each wind turbine is fitted with vibration monitoring sensors so that if an imbalance is detected in the operation of a wind turbine, it will be shut down, and the operator notified for evaluation and/or possible repair. For additional details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0006-14	Greg Snow	The sound level assessment states that no pure tones were identified in sound spectra, what about swept tones, low frequency sounds that are produced by rotating blades plus the Doppler effect?	As discussed in Section 7.3 of Appendix J, Sound Level Assessment Report, low frequency sound will be produced by the proposed wind turbines, same as any other piece of mechanical equipment. However, it will be below levels that are problematic. It is unclear what the commenter means by "swept tones" and the "Doppler effect" with regard to wind turbine sound. For more details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.
SDEIS-0007-5	Christopher Warner	I oppose the siting of turbines where I will hear the repetitive or low frequency sound of blades turning. This will destroy the quiet atmosphere rural residents are accustomed to. The SDEIS says the noise will be like an uepisodic event such as passing of cars or barking of dogs" (page 2.8-1). The regular, repetitive, or low-frequency drumming of turbine noise is not appropriate to compare to dog and car noise I experience because of the frequency. I only hear one car drive up my dirt road every hour or two, or hear a dog bark a few times once or twice a day if at all.	As discussed in Section 7.3 of Appendix J, Sound Level Assessment Report, low frequency sound will be produced by the proposed wind turbines, same as any other piece of mechanical equipment, for example, an air conditioner or fan. However, it will be below levels that can induce vibration or rattle. While sound produced by the turbines may be audible at times, it is a "whooshing" sound of the blades turning through the air which is not low frequency sound. The sound modelling predicts that no residence will be within the 50 dB noise limit imposed by local law. Table A-1 in Appendix J, Sound Level Assessment Report, shows that Project sound levels would range from 20 to 49 dB at the 335 modelled sensitive receptors sites within the proposed Project Area.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-6	Christopher Warner	I am very concerned about the health of my children, age 6 and 7, with the turbines so close to the house. One of my sons has recently been diagnosed with a learning disability and sensory issues, and I do not want the repetitive turbine motion or repetitive sound to create negative stimulus for him, and cause me to have to move to keep my family healthy.	As noted in Appendix I, Visual Resource Assessment, evidence from operational turbines suggests that the intensity of shadow flicker is only an issue at short distances. Shadow flicker is typically not found to occur at distances greater than 10 rotor diameters from a wind turbine. Beyond 10 rotor diameters, a person should not perceive a wind turbine to be chopping through sunlight, but rather as an object with the sun behind it. As shown in Figures 5 and 6 of the VRA (see Appendix I), properties on Straight Road are located at distances greater than 10 rotor diameters from Project wind turbines, so shadow flicker would not be anticipated to be an issue at the commenter's property. Please refer to Appendix I to review the shadow flicker study. Regarding sound caused by operation of the Project, please refer to Appendix J, Sound Level Assessment Report. All sound levels from the wind turbines, no matter where you live, will be less than 50 dBA outside the house. Sound from outside the house is reduced approximately 15 dBA to inside the house with open windows. Therefore, sound level from the wind turbines will be less than 35 dBA. Ball Hill will take into account landowners concerns in accordance with the Project complaint resolution process described in Appendix L, Complaint Resolution Plan.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0010-5	Jonathan Titus	4. I am concerned that the noise analysis does not adequately address low frequency sounds.	As shown in Table 7-3 of Appendix J, Sound Level Assessment Report, the predicted maximum levels of Project sound at 31.5 Hz at the 10 highest modeling receptors are all 63 dB or lower - well below the 74 dB level prescribed by the noise criterion established for private home interiors by NC-30, and the 71 dB equivalent level for moderately perceptible vibration and rattle Appendix J, p. 7-4).
SDEIS-0011-5	Priscilla Titus	The noise impacts are not adequately analyzed to reflect low frequency sound anticipated with the current project design.	As shown in Table 7-3, of Appendix J, Sound Level Assessment Report, the predicted maximum levels of Project sound at 31.5 Hz at the 10 highest modeling receptors are all 63 dB or lower - well below the 74 dB level prescribed by the noise criterion established for private home interiors by NC-30, and the 71 dB equivalent level for moderately perceptible vibration and rattle (see Appendix J, p. 7-4).
SDEIS-0015-24	Lisa Brain	I'm concerned very much about the noise because from my house on that map I think there is twenty-eight, and I think four of them are literally going to be wrapped around my property.	According to Figure A2 of the Visual Resource Assessment for the Project (see Appendix I of this FEIS) 16-25 turbines would be visible from the corner of Villenova Road and North Hill Road when the Project is fully operational. As detailed on Figure 6-1 of the Sound Level Assessment Report (see Appendix J of this FEIS), the receptors located at the corner of Villenova Road and North Hill Road would experience Sound levels less than 50 dB outside the house. Sound from outside the house is reduced approximately 15 dBA to inside the house with open windows. Therefore, sound level from the wind turbines would be less than 35 dBA inside the house. For additional details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-28	Lisa Brain	Also like I said, the noise. I'm worried about so many. Am I even going to be able to hear the TV if I have my windows open in the summer? What else did we have?	All sound levels from the wind turbines, no matter where you live, will be less than 50 dBA outside the house. Sound from outside the house is reduced approximately 15 dBA to inside the house with open windows. Therefore, sound level from the wind turbines will be less than 35 dBA inside which will not interfere with watching television. For more details on the Sound Level Assessment for the Project (see Appendix J, Sound Level Assessment Report).
SDEIS-0015-59	Greg Snow	I'd like to know where I can go and see and hear one of these GE's for myself. I'm very concerned about the noise, is pretty much the only thing that bothers me about this project.	The GE turbine was not selected for this Project. The Vestas V112 turbine is in operation at the Marble River Wind Project in Clinton County, New York. Siting of the V126 turbines in the Towns of Villenova and Hanover has resulted in all sound levels from the wind turbines, no matter where you live, being less than 50 dBA outside the house. Sound from outside the house is reduced approximately 15 dBA to inside the house with open windows. Therefore, sound level from the wind turbines will be less than 35 dBA inside.
SDEIS-0015-82	Becky Laberi	You mentioned RES has its own turbines up in Canada and the radio stations that I listened to they were taking them down because of the noise. Because of the noise, the health issues related to the noise.	RES Americas does not own any machines in Canada. No Projects that RES Americas has been involved with have had any noise complaints resulting in turbines being dismantled. The only Project in Canada that RES Americas, Inc., is aware of that was threatened with having machines removed was the Erieau project in southern Ontario. Three years ago the project received a complaint due to the proximity of an airport. The complaint was not withheld and the machines stayed in operation.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Visual Resources			
SDEIS-0001-11	Public Service Commission	VISUAL The depiction of an existing substation at the SVRA may not be fully representative of the scale of facilities needed for the proposed 230 kV transmission line (SDEIS, Appendix M, Section 3.8. photograph "Substation Example", pg. 55). The "Substation Example" photograph depicts the Bliss Windpark substation from the Wyoming County NY Town of Eagle. DPS notes that the Bliss substation is a 115 kV facility, not a 230 kV facility as proposed for the Ball Hill Project. The scale of certain equipment is typically larger on higher voltage installations. The FEIS should provide appropriate representations and descriptions of proposed facilities so that appropriate characterization and consideration of cumulative impacts of the Ball Hill Wind project and associated major electric transmission facility is documented.	The concerns of the NYSPCS have been reviewed and the proposed transmission line would be 115 kV, not 230 kV. Its constructability has been reviewed by RES engineers. A picture of a typical 115 kV and 230 kV substation is included in the VRA (see Appendix I of this FEIS). Typical Transmission Line Plan and Profile Drawings are included in Appendix C, Project Drawings, in this FEIS. Cumulative impacts from this Project, its associated transmission facilities and other wind projects including their associated transmission facilities in the region are analyzed in the FEIS as Section 1.4.16.
SDEIS-0001-12	Public Service Commission	DPS previously provided specific recommendations for substation lighting design and impact minimization. The SDEIS addresses certain aspects of these recommendations, but does not fully address impact minimization through requiring lighting design specifications (e.g., SDEIS Section 2.6.3.4, pg. 2.6-32). DPS repeats its recommendations: fixtures should be specified as full-cutoff with no drop-down optics. Task lighting should be controlled by manual switches to allow workers to light areas appropriate as needed to accomplish tasks. Motion triggered lighting can be inappropriately triggered by wildlife, blowing trash or vegetation, and is not recommended. Manufacturer's cut sheets should be provided, which specify lighting illuminance levels and pattern, and which list features as discussed above regarding light cutoff, shields, and optic criteria.	During construction and operation, lighting at the substation and O&M facility will consist of manually activated full-cutoff exterior lighting and temporary work lighting, with no drop down optics. During normal operations the substation will not be lit except as required for site security and/or as required by federal, state, or local agencies. Routine maintenance work at the substation is expected to occur during daylight hours; however nighttime work (requiring lighting) may be required in an emergency or for reliability reasons. Manufacturer cut sheets are not available at this time, as a specific manufacturer has not yet been chosen.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0004-2	Martin Huber	I want you to know that I am very much against construction of these wind turbines. I believe that living literally right next to one of these towers will negatively effect my land value, and quality of life. I have lived near the wind farm near Warsaw NY while attending college, and I know firsthand that living in one of these farms is not pleasant.	The SDEIS and FEIS contain all studies conducted to analyze the impact of the Project, including in areas that may affect the quality of life of community members, such as impacts on visual resources, sound, and socioeconomics. The Project will be constructed in accordance with all applicable regulations that serve to protect community members' quality of life.
SDEIS-0004-3	Martin Huber	If you want to see what will happen to our town just take a ride up route 20a near Warsaw and take a look around. There are windmills as far as the eye can see in every direction. This has completely destroyed the beautiful landscape that area once had. I sincerely hope that you take into consideration the feelings of your constituents before any decisions are made.	The Visual Resource Assessment (Appendix I) contains a detailed study of the visual impact of the Project, including a number of visual simulations of how the turbines will appear from different vantage points in the towns, so that Town Board members and community members can comment on the Project based on an informed understanding of its impact on the appearance of the landscape.
SDEIS-0006-1	Greg Snow	I am opposed to the Ball Hill Wind project, the proposed turbines are too large to be sited near people.	The Project adheres to the Towns' setback requirements of 1,000 feet from the nearest off-site residence and 500 feet from the nearest public road. Additionally, per Ball Hill policy, whenever practicable there are be setbacks of at least 500 meters (1,642 feet) from existing residences to ensure maximum screening benefit of existing woodland vegetation, where such exists, and minimize sound impact and the potential for extended duration shadow flicker on nearby residences.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-3	Christopher Warner	The construction of large wind turbines, that are taller than every building or tower in Chautauqua, Cattaraugus and Erie County, except for the HSBC tower in downtown Buffalo, will dramatically change the landscape, in particular, imposing a constant visual and audial disturbance in this rural area. I live on a farm, with barns, farm animals, fields and wooded land. The Ball Hill Wind Project proposal should not be called a wind "farm" proposal, it is a proposal to install extremely large industrial power generators in a farming area. It will change the area significantly and at least for the rest of my lifetime.	A VRA (see Appendix I of this FEIS) was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and cumulatively with other proposed wind energy projects. The VRA was prepared according to NYSDEC Program Policy "Assessing and Mitigating Visual Impacts" (NYSDEC 2000) (DEC Visual Policy) and SEQRA criteria to minimize impacts on visual resources. Whenever practicable, turbines have been sited in accordance with local Town laws, which require minimum setback distances. Ball Hill's policy is to site turbines beyond the minimum setback to distances of at least 500 meters (1,642 feet) from existing residences whenever practicable. Such separation of uses assures maximum screening benefit of existing woodland vegetation, where such exists, and minimizes the potential for shadow flicker on nearby residences. Section 1.4 and Appendix I, Visual Resource Assessment, of this FEIS provide a thorough review of potential visual impacts as compared to the layout presented in the SDEIS. As detailed in Appendix J, Sound Level Assessment Report, sound produced by the wind turbines may be audible at times, but would be within the sound-level limits approved by the Town of Villenova. For more details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-4	Christopher Warner	I oppose the siting of turbines where I will be able to see from my property large blades turning, constant motion will be a visual distraction. I am also concerned with the potential for turbine "flicker" if sun is behind the turbines, and do not agree the statement within the Ball Hill Supplemental Draft Environmental Impact Statement (1/19/2016) that flicker that occurs shortly after sunrise will not impact residents because they "are typically asleep with the shades drawn" (page 2.7-12). The SDEIS apparently wasn't written by farmers or residents who wake up early or don't need shades for privacy or want shades in the house like myself.	Evidence from operational turbines suggests that the intensity of shadow flicker is only an issue at short distances. Shadow flicker is typically not found to occur at distances greater than 10-rotor-diameters from a wind turbine. Beyond 10-rotor-diameters, a person should not perceive a wind turbine to be chopping through sunlight, but rather as an object with the sun behind it. As shown in Figures 5 and 6 of the VRA (Appendix I), properties on Straight Road are located at distances greater than 10-rotor-diameters from Project wind turbines, so shadow flicker would not likely be perceived at the location identified, i.e. whether or not the resident's windows are shaded, shadow flicker would not be expected to occur. For additional information on shadow flicker definition and analysis see Section 1.4 of this FEIS and Appendix I, Visual Resource Assessment.
SDEIS-0008-1	Charles Leone	My name is Charlie Leone and I am a concerned property owner in Hanover and Villanova. I have been looking over these beautiful hills for 52 years and am devastated that the landscape is in danger of losing that beauty. The proposed windmills are a monstrosity.	A VRA was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and in combination with other proposed wind energy projects. The VRA provides a description of the visual impacts from the Project and photo simulations to represent what the V126 wind turbine would look like from certain vantage points in the Towns of Hanover and Villenova. Please refer to Appendix I, Visual Resource Assessment, of this FEIS for additional information and simulations.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0009-2	Doug Rumsey	All I can say is. I am not for it. If I have to pay taxes. Then I shouldn't have to look out my window and see this.	A VRA was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and in combination with other proposed wind energy projects. The VRA provides a description of the visual impacts from the Project and photo simulations to represent what the V126 wind turbine would look like from certain vantage points in the Towns of Hanover and Villenova. Please refer to Appendix I, Visual Resource Assessment, of this FEIS for additional information and simulations.
SDEIS-0009-3	Doug Rumsey	Our hills look fine like they are. Plus the decrease in property values for this.	An analysis of the potential effects of the Project on property values is presented in this Final Environmental Impact Statement (FEIS) in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to being in proximity or in the viewshed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad based value effects have occurred in those markets. Please refer to Appendix Q for additional information.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0014-5	Judy Phillips	Construction and operation of this project would cause damaging, irreversible, wildlife and plant habitat fragmentation, considerable long term environmental and major negative visual impacts to our rural community.	A habitat fragmentation analysis looking at direct and indirect impacts to "valuable" forested habitat , as defined by NYSDEC, has been conducted for the Project, the results of which are detailed in Section 1.4.5, Biological Resources, and 1.4.16, Cumulative Impacts. The analysis was conducted using guidelines presented in "NYSDEC direct and indirect impacts to interior wildlife species" and has been conducted following the NYSDEC documented titled *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects*, June 2016. The analysis found there are 12 blocks of forested land greater than 150 acres in size. The Project would impact 118.9 acres of forested land in total, and would increase the number of forest blocks greater than 150 acres to 15 and would cut one forest block into a size smaller than 150 acres. More details can be found in Section 1.4.5 of this FEIS. A VRA (see Appendix I of this FEIS) was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and cumulatively with other proposed wind energy projects. The VRA was prepared according to NYSDEC Program Policy "Assessing and Mitigating Visual Impacts" (NYSDEC 2000) (DEC Visual Policy) and SEQRA criteria to minimize impacts on visual resources. Section 1.4.7 and Appendix I of this FEIS provide a thorough review of potential visual impacts as compared to the layout presented in the SDEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-2	Tina Graziano	We finished it in 2001. From the front steps we can see Arkwright to Round Top to North Hill to Ball Hill and on, and guess where the turbines are going according to the map of the project -- which was also online that tells you what you can see, we will see over twenty-five. Our beautiful view will be full of steel. I had no idea this would ever happen. I always thought we would preserve our wonderful landscape. It's what we're known for here. That's why we are here and that's why we are living here. If we wanted a man-made skyline we would live in a city.	A VRA (see Appendix I of this FEIS) was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and cumulatively with other proposed wind energy projects. The VRA was prepared according to NYSDEC Program Policy "Assessing and Mitigating Visual Impacts" (NYSDEC 2000) (DEC Visual Policy) and SEQRA criteria to minimize impacts on visual resources. Whenever practicable, turbines have been sited in accordance with local Town laws, which require minimum setback distances. Ball Hill's policy is to site turbines beyond the minimum setback to distances of at least 500 meters (1,642 feet) from existing residences whenever practicable. Such separation of uses assures maximum screening benefit of existing woodland vegetation, where such exists, and minimizes the potential for shadow flicker on nearby residences. Section 1.4 and Appendix I, Visual Resource Assessment, of this FEIS provide a thorough review of potential visual impacts as compared to the layout presented in the SDEIS.
SDEIS-0015-3	Tina Graziano	Not only will we constantly have this in our face, I have to observe every turbine killing and maiming our wildlife. I counted twenty-two turbines all around wet spots. What are you thinking? There's nothing on these turbines about the bats.	Less than one acre of wetlands is expected to be permanently filled by the Project. Wet areas within the Project are identified in detail in Appendix E of this FEIS, Water Quality and Wetlands. Ball Hill worked diligently to avoid wet areas and minimize impacts to these areas. Ball Hill also sited turbines with the intent to minimize impacts to wildlife and the environment. Section 1.4.5 and 1.4.6 of the FEIS identifies the potential environmental impacts from the Project on wildlife and biological resources.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-17	Howard Crowell	And if you look at something -- you're talking about maybe afraid they're going to ruin their view, as far as I understand, I think they are beautiful. I got pictures of the sunrise on my cell phone with the background and the windmills and I think they are beautiful.	A VRA was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and in combination with other proposed wind energy projects. The VRA provides a description of the visual impacts from the Project and photo simulations to represent what the V126 wind turbine would look like from certain vantage points in the Towns of Hanover and Villenova. Please refer to Appendix I, Visual Resource Assessment, of this FEIS for additional information and simulations.
SDEIS-0015-21	Cliff Rumsey	Myself personally, I can remember the Pike area when they didn't have any and it doesn't look too pretty up there no more, so -- and there's a lot of them there.	A VRA was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and in combination with other proposed wind energy projects. The VRA provides a description of the visual impacts from the Project and photo simulations to represent what the V126 wind turbine would look like from certain vantage points in the Towns of Hanover and Villenova. Please refer to Appendix I, Visual Resource Assessment, of this FEIS for additional information and simulations.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-23	Lisa Brain	Yes, I agree the global everything, but as far as yeah, they do look beautiful but not in my back yard. Maybe in the far distance.	A VRA (see Appendix I of this FEIS) was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and cumulatively with other proposed wind energy projects. The VRA was prepared according to NYSDEC Program Policy "Assessing and Mitigating Visual Impacts" (NYSDEC 2000) (DEC Visual Policy) and SEQRA criteria to minimize impacts on visual resources. Whenever practicable, turbines have been sited in accordance with local Town laws, which require minimum setback distances. Ball Hill's policy is to site turbines beyond the minimum setback to distances of at least 500 meters (1,642 feet) from existing residences whenever practicable. Such separation of uses assures maximum screening benefit of existing woodland vegetation, where such exists, and minimizes the potential for shadow flicker on nearby residences. Section 1.4 and Appendix I, Visual Resource Assessment, of this FEIS provide a thorough review of potential visual impacts as compared to the layout presented in the SDEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-30	Judy Phillips	I've also read the entire binder. I do not see a picture up here of the photo simulations of Route 93, the photo simulations that were taken from up on top of Flipper Hill.	A VRA was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and in combination with other proposed wind energy projects. The VRA provides description of the visual impacts from the Project and photo simulations to represent what the V126 wind turbine would look like from certain vantage points in the Towns of Hanover and Villenova. Please refer to Appendix I, Visual Resource Assessment, of this FEIS for additional information and simulations. In Appendix I, Figures A 15-a through A 15-i show photo simulations on Flucker Hill Road and Figures A 16-a through A 16-i show photo simulations along Route 93.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-32	Don Chase	If shadow flicker is not covered under the SDEIS, what is covered under it?	A VRA (see Appendix I of this FEIS) was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and cumulatively with other proposed wind energy projects. The VRA was prepared according to NYSDEC Program Policy "Assessing and Mitigating Visual Impacts" (NYSDEC 2000) (DEC Visual Policy) and SEQRA criteria to minimize impacts on visual resources. Whenever practicable, turbines have been sited in accordance with local Town laws, which require minimum setback distances. Ball Hill's policy is to site turbines beyond the minimum setback to distances of at least 500 meters (1,642 feet) from existing residences whenever practicable. Such separation of uses assures maximum screening benefit of existing woodland vegetation, where such exists, and minimizes the potential for shadow flicker on nearby residences. Section 1.4 and Appendix I, Visual Resource Assessment, of this FEIS provide a thorough review of potential visual impacts as compared to the layout presented in the SDEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-43	Judy Phillips	They talked in the winter a lot about mitigating -- making things less destructive or interfering. The one thing that cannot be mitigated, in my opinion, is that I believe our community's greatest asset and most valuable resource is our picturesque landscape. It helps define the self-image of our residents who choose to inhabit. They choose it and it gives them a sense of place to the change in seasons. It is a dynamic backdrop to people's lives. I hope many of our residents, tourists and hunters value the aesthetic unadulterated view of our own scenic rolling hills with some views as far as Lake Erie. Building this industrial project would exploit and ruin our landscape and irreplaceable aesthetic. RES Americas is the company in charge of constructing this project and will request amendment of Villenova and Hanover's wind laws, four hundred twenty feet limitation on maximum turbine height increased to four hundred and ninety-eight feet. The year-round visual impact would be significant and cannot be mitigated due to the introduction of thirty-six five-hundred-foot turbines, the height of a fifty-story building. The large area of our town involved with the project, the ongoing movement of a hundred and eight massive rotor blades and the project's total seven-point-five-mile view.	Ball Hill is now proposing to construct 29 turbines, rather than the 36 turbines proposed in the SDEIS. Appendix I, Visual Resource Assessment, of the FEIS was prepared to evaluate the visual impact of the Project at particular locations, including residences, and in the surrounding area, both on its own and cumulatively with other proposed wind energy projects. The VRA was prepared according to NYSDEC Program Policy Assessing and Mitigating Visual Impacts (NYSDEC 2000) (DEC Visual Policy) and SEQRA criteria to minimize impacts on visual resources. Whenever practicable, turbines have been sited in accordance with local Town laws, which require minimum setback distances. Ball Hill's policy is to site turbines beyond the minimum setback to distances of at least 500 meters (1,642 feet) from existing residences whenever practicable. Such separation of uses assures maximum screening benefit of existing woodland vegetation, where such exists, and minimizes the potential for shadow flicker on nearby residences. Section 1.4 and Appendix I, Visual Resource Assessment, of this FEIS provide a thorough review of potential visual impacts as compared to the layout presented in the SDEIS. The Project expects to get a Finding of Adverse Affect from the State Historic Preservation Officer (SHPO) with respect to impacts on historic structures. Ball Hill is consulting with SHPO under Section 106 of the National Historic Preservation Act of 1966 in order to identify a mitigation plan for the Project. Potential mitigation plans are outlined in Appendix N of this FEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Safety			
SDEIS-0003-62	Department of Environmental Conservation	Required Items Not Provided A Spill Control and Countermeasure Plan must be provided. Based on NYSDEC's experience with similar wind energy projects, spills of petroleum and other chemicals may occur during the construction and operational phases of the project. As such, the applicant should develop a spills management plan that is consistent the Department's regulations regarding petroleum bulk storage, chemical bulk storage and spill response and remediation. As guidance, the applicant can refer to the Department's guidance document entitled "Leaks, Spills and Accidents Management Practices Catalogue for Nonpoint Source Pollution Prevention and Water Quality Protection in New York State," found at the following link: www.dec.ny.gov/docs/water pdf/leaksspillsbmp.pdf. The applicant can also refer to spill management plans that have been developed for other recent wind energy projects such as the Marble River Wind Project. The applicant should work with Regional NYSDEC spill response staff to ensure that the plan is adequate.	Ball Hill will develop and implement a construction spill prevention and control (SPCC) plan prior to construction. In addition, prior to operation of the Project, Ball Hill will develop an operational SPCC plan, pursuant to 40 Code of Federal Regulations (CFR) Part 112, because oil on site would be greater than 1,320 gallons. Sources of oil could include the main power transformer, gear oils, and hydraulic fluids located in the turbines, and any oil or fuel storage as part of construction. Ball Hill general policies for the implementation of environmental monitoring practices are included in the Environmental Monitoring Plan in Appendix S.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0007-6	Christopher Warner	I am very concerned about the health of my children, age 6 and 7, with the turbines so close to the house. One of my sons has recently been diagnosed with a learning disability and sensory issues, and I do not want the repetitive turbine motion or repetitive sound to create negative stimulus for him, and cause me to have to move to keep my family healthy.	As noted in Appendix I, Visual Resource Assessment, evidence from operational turbines suggests that the intensity of shadow flicker is only an issue at short distances. Shadow flicker is typically not found to occur at distances greater than 10 rotor diameters from a wind turbine. Beyond 10 rotor diameters, a person should not perceive a wind turbine to be chopping through sunlight, but rather as an object with the sun behind it. As shown in Figures 5 and 6 of the VRA (see Appendix I), properties on Straight Road are located at distances greater than 10 rotor diameters from Project wind turbines, so shadow flicker would not be anticipated to be an issue at the commenter's property. Please refer to Appendix I to review the shadow flicker study. Regarding sound caused by operation of the Project, please refer to Appendix J, Sound Level Assessment Report. All sound levels from the wind turbines, no matter where you live, will be less than 50 dBA outside the house. Sound from outside the house is reduced approximately 15 dBA to inside the house with open windows. Therefore, sound level from the wind turbines will be less than 35 dBA. Ball Hill will take into account landowners concerns in accordance with the Project complaint resolution process described in Appendix L, Complaint Resolution Plan.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0014-4	Judy Phillips	This project would cause health problems for residents.	Ball Hill is not sure what health problems the commenter feels may occur as a result of the Project. Section 2.15 of the SDEIS (Health and Safety) and Appendix P of the FEIS (Health and Safety Plans) discuss health and safety measures to be taken during construction and operation of the Project.
SDEIS-0015-7	Tina Graziano	Right now the proposed turbines hold about a hundred gallons of oil, just an environmental hazard waiting. We can wait and see how everyone handles Arkwright's project. Let them be a sacred cow. Once you have them in your face you might change your mind.	Appendix P, Health and Safety Plans, of the FEIS discusses how Ball Hill will recognize and address safety hazards, and Appendix D includes Material Safety Data Sheets.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-27	Lisa Brain	I have done reading and research because it is important to me, something with the sun reflecting on it like a strobe-type lighting reflection. I have two people that have epilepsy in my house and worry about them.	Shadow flicker is discussed in Section 1.4.7 and in the VRA (Appendix I). Modern, commercial-sized wind turbines do not cause flicker that is fast enough to cause epileptic seizures. Flicker frequency due to a turbine is on the order of the rotor frequency (i.e., 0.6 to 1.0 Hz), which is harmless to humans. According to the Epilepsy Foundation, only frequencies above 10 Hz are likely to cause epileptic seizures. This has been documented by the following resources: National Research Council. 2007. Environmental Impacts of Wind-Energy Projects. Washington, DC: The National Academies Press. Accessed online at: https://www.nap.edu/catalog/11935/environmental-impacts-ofwind-energy-projects Massachusetts Departments of Environmental Protection and Public Health. January 2012. Wind Turbine Health Impact Study: Report of Independent Expert Panel January 2012. Accessed online at: http://www.mass.gov/eea/docs/dep/energy/wind/turbine-impact-study.pdf

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-42	Lisa Brain	What about ice build-up on that? We live in wintery stuff. How would that -- I know you said you set them back so far, but like I mean, that's like a big icicle heading your way.	Ice shed and the prevention measures to be taken to effectively minimize risks to safety if icing were to occur are discussed in Section 2.15.6 of the SDEIS. Academic research and risk analyses have been conducted on the subject of ice shed and throw, primarily in Europe. The general conclusion is that wind turbines should not cause risks as they are normally set back from residences and roadways and that the hypothetical risk of being struck by ice is small, particularly by large and/or long ice fragments, which experience more drag and will hit the ground closer to the turbine.
SDEIS-0015-46	Judy Phillips	What benefits some should not harm others. Infrasound sound disturbances caused by air pressure variances and shadow flicker generated by blade rotation may cause negative health effects and quality of life issues. These environmental problems may be difficult to prove, but with approval of this project these problems could adversely affect our own community. Are you willing to roll the dice?	Whenever practicable, the Project will adhere to the Towns' setback requirements of 1,000 feet from the nearest off-site residence and 500 feet from the nearest public road. In addition, per Ball Hill policy, whenever practicable there will be setbacks of at least 500 meters (1,642 feet) from existing residences to ensure maximum screening benefit of existing woodland vegetation, where such exists, and minimize sound impact and the potential for extended duration shadow flicker on nearby residences. In 2016, Epsilon Associates, Inc., conducted computer modeling to predict future sound levels when the proposed wind turbines and associated electrical transformers would be operational, based on the revised Project design. The results of this analysis and an evaluation of compliance with applicable criteria are presented in Appendix J, Sound Level Assessment Report. In addition, the topic of infrasound is responded to in Section 1.4.15 of this FEIS. As noted in Appendix I, Visual Resource Assessment, evidence from operational turbines suggests

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
			that the intensity of shadow flicker is only an issue at short distances. Shadow flicker is typically not found to occur at distances greater than 10 rotor diameters from a wind turbine. Beyond 10 rotor diameters, a person should not perceive a wind turbine to be chopping through sunlight, but rather as an object with the sun behind it. Please refer to Appendix I for a discussion of shadow flicker. There are no regulations or guidelines that establish an acceptable degree of shadow flicker impact on a potential receptor. For residences where shadow flicker is greatest, mitigation of the disturbance in a specific room may be implemented by the use of window shades or vegetative screening. Mitigation will be taken on a case-by-case basis where shadow flicker or other adverse visual impacts pose a significant problem for a landowner in accordance with the Project complaint resolution process described in Appendix L, Complaint Resolution Plan
SDEIS-0015-63	Chuck Luce	Did you ever have one of these towers come down? I know they recently had one in Denmark, the wind over-speeded it and it come off the blade and chopped the tower off.	No project that RES Americas is operating has experienced a wind turbine that came down. There have been a very limited number of turbine failures worldwide where proper setbacks have prevented any significant damage.
SDEIS-0015-73	Judy Phillips	Am I correct in what I'm reading here, that RES Americas has a balance of plant contractor -- balance of plan contractor at the Mehoopany wind farm in Pennsylvania? Was there -- it says here that a blade crashed I believe in 2014 and it was operational in 2012.	RES Americas was the contractor responsible for constructing the "balance of project" at the Mehoopany Wind Farm. This includes civil work but not turbine manufacture or installation. RES Americas has no special knowledge of the cause of the blade failure on a GE 1.6MW turbine in November 2014.
Decommissioning			

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0006-13	Greg Snow	Will a turbine be shut down during critical times (eg. overnight) if noise problems cannot be resolved?	If a turbine is determined to be non-compliant with applicable noise limits, and it cannot be corrected, it would be shut down as non-compliant.
SDEIS-0010-2	Jonathan Titus	1. It is very important that a foolproof guarantee be associated with the project such that if the project is abandoned or decommissioned Renewable Energy Systems is obligated to restore all of the sites to the highest possible standards. This must be a large enough bond such that a clean-up will occur regardless of the status of Renewable Energy Systems. A lack of protection to local communities from abandoned energy projects has been a problem across the country.	In 2008, a decommissioning plan for the Project was reviewed and accepted as complete by the Villenova Town Board as SEQRA Lead Agency. The decommissioning plan has been updated and is included the FEIS as Appendix R, Decommissioning Plan. The updated plan, prepared in accordance with the Town of Villenova Local Law No. 1 of 2007: Wind Energy Facilities Law, the Town of Hanover WECS Law (2008), and the terms and conditions of any agreements with the Towns, reflects current costs and numbers associated with decommissioning activities.
SDEIS-0011-4	Priscilla Titus	I have concerns regarding long term maintenance of the structures in the event that this project does not yield the financial rewards that are anticipated. Who will be responsible for decommissioning the structures should they fail to perform as desired?	In 2008, a decommissioning plan for the Project was reviewed and accepted as complete by the Villenova Town Board as SEQRA Lead Agency. The decommissioning plan has been updated and is included the FEIS as Appendix R. The updated plan, prepared in accordance with the Town of Villenova Local Law No. 1 of 2007: Wind Energy Facilities Law, the Town of Hanover WECS Law (2008), and the terms and conditions of any agreements with the Towns, reflects current costs and numbers associated with decommissioning activities.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0014-8	Judy Phillips	Decommissioning agreement may be very difficult to enforce with another perhaps oversees located wind company. Turbines could be rebuilt or replaced on land after their 20 year "lifespan". Wind farms are often sold multiple times because any new owner will receive tax incentives based upon the higher, original start-up value of a turbine.	In 2008, a decommissioning plan for the Project was reviewed and accepted as complete by the Villenova Town Board as SEQRA Lead Agency. The decommissioning plan has been updated and is included the FEIS as Appendix R. The updated plan, prepared in accordance with the Town of Villenova Local Law No. 1 of 2007: Wind Energy Facilities Law, the Town of Hanover WECS Law (2008), and the terms and conditions of any agreements with the Towns, reflects current costs and numbers associated with decommissioning activities.
SDEIS-0015-40	Barry Nobles	What was the answer to the long-term shutdown twenty years from now and when everything is rusty?	The law requires the creation of a decommissioning bond that is updated on a regular basis, so that the Town could remove the Project facilities if the company failed to do so. The decommissioning plan for the Project has been updated from the original 2008 version and is included the FEIS as Appendix R. The updated plan, prepared in accordance with the Town of Villenova Local Law No. 1 of 2007: Wind Energy Facilities Law, the Town of Hanover WECS Law (2008), and the terms and conditions of any agreements with the Towns, reflects current costs and numbers associated with decommissioning activities.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-49	Judy Phillips	Am I correct in understanding Villenova does not have a comprehensive plan but includes decommissioning requirements in our local zoning laws? Do we have a removal clause for non-operation for a specific time so that non-removal would then become a zoning enforcement matter? If so, what does that specify? The industrial projects are frequently sold multiple times to different corporations. After twenty years the town's decommissioning agreement may not be signed with the current owner of the industrial turbine facility. It could prove difficult to impose the town's agreement with a large corporation that may be based overseas. Can there be re-evaluation, replacement or re-powering of the turbines after twenty years? Mr. Norton, Arkwright town supervisor, made reference to Article 10 of the public service law in his December 15, 2015 letter to The Observer. The Arkwright project may be the last to generate the funding through host agreements associated with the local community. Do we have a host agreement and can it be still be implemented?	The law requires the creation of a decommissioning bond that is updated on a regular basis, so that the Town could remove the Project facilities if the company failed to do so. The decommissioning plan for the Project has been updated from the original 2008 version and is included in the FEIS as Appendix R. The updated plan, prepared in accordance with the Town of Villenova Local Law No. 1 of 2007: Wind Energy Facilities Law, the Town of Hanover WECS Law (2008), and the terms and conditions of any agreements with the Towns, reflects current costs and numbers associated with decommissioning activities. The Project Sponsor is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective Towns.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Cumulative Impacts			
SDEIS-0001-13	Public Service Commission	CUMULATIVE IMPACTS In consideration of cumulative estimates of bird and bat fatalities, the SDEIS refers to the Cassadaga Wind project as proposing "70" turbines (SDEIS Section 4.2.2 Avian and Bat Species, including Table 4.2-2, pg. 4-6; Table 4.2-3, pg. 4-7; and discussion at pp. 4-8 and -9). DPS suggests that the calculation of total cumulative fatalities of birds and bats be reviewed based on the current proposal by Everpower Inc. for the Cassadaga Wind Project currently in development of an Application pursuant to PSL Article 1 O in Case 14-F-0490. Pre-application materials identify the Cassadaga Wind facility as a "proposed 126 megawatt" project including construction and operation of "up to 62 wind turbines" (Cassadaga Wind Project Preliminary Scoping Statement, September 2015).	This change has been made. Cumulative visual impacts of the Ball Hill Wind Project, and the proposed Arkwright Summit and Cassadaga Wind Projects (up to 62 turbines) are described, illustrated and discussed in the Ball Hill Wind Project Final Visual Resource Assessment, beginning at page 54 (attached to this FEIS as Appendix I). In addition an updated cumulative impact analysis is included in the FEIS as Section 1.4.16.
SDEIS-0003-33	Department of Environmental Conservation	4 Summary of Cumulative Impacts. While the section discusses aspects of cumulative impacts from the proposed Cassadaga and Arkwright wind projects, this section should further elaborate on the issues raised in the above comments with respect to bird and bat impacts, cumulative loss of habitat, and habitat fragmentation as a result of the construction of all proximate projects. The SDEIS states multiple times that cumulative impacts to habitat are not expected to be significant and that "wildlife would likely relocate to adjacent suitable habitat during construction or, upon cessation of construction, make use of areas temporarily disturbed, as revegetation takes place." No further information is provided to support this and it is unlikely that interior forest bird species will utilize cleared areas for breeding purposes since those areas will take decades to return to pre-construction conditions.	The cumulative impacts assessment has been updated to reflect updated information on the Cassadaga Wind Project and the updated Project layout in Section 1.4.16 of the FEIS.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0003-36	Department of Environmental Conservation	The proximity of the Project to the proposed Cassadaga wind project to the south/southwest and the Arkwright project to the west/southwest collectively covers a large area of northern Chautauqua County. The applicant should thoroughly describe and evaluate the cumulative impacts of all these projects on birds, bats, and their habitats, including estimated mortality levels and the indirect effects of fragmentation of contiguous forests, grassland, and wetlands.	The cumulative impacts assessment has been updated to reflect updated information on the Cassadaga Wind Project and the updated Project layout in Section 1.4.16 of the FEIS. Impacts on wildlife and habitat (including fragmentation) has been added to the analysis.
SDEIS-0007-10	Christopher Warner	I am concerned about the cumulative impacts multiple large Wind Projects will have along the Chautauqua Ridge. I participated in public hearings on the Arkwright Summit Wind Farm years ago and thought the project was not moving forward until newspaper articles announced that it would be constructed in 2017. I have heard there are other projects planned in the area, such as the Cassadaga Wind Project, in addition to the Arkwright Summit Wind Farm and the Ball Hill Wind Project, and believe that in an effort to get their project approved, any individual project developer will minimize and underestimate the combined, cumulative negative impact on community residents who will be surrounded by turbines, as well as birds and bats that migrate along the ridge and through the area. The Ball Hill Wind Project and the Arkwright Wind Farm are so close (the closest turbines are 1.4 miles apart according to the SDEIS, page 4.1) that the projects environmental impact should be assessed together, as once constructed residents and wildlife will just be living within and migrating through and around one extremely large industrial wind project.	Cumulative impacts associated with construction and operation of the Ball Hill Wind Project, Arkwright Summit Wind Farm Project, and Cassadaga Wind Project are discussed in the following documents: (1) Section 4 of the SDEIS and Section 1.4.16 of this FEIS for the Ball Hill Wind Project; (2) The SEIS2 and FEIS for the Arkwright Summit Wind Farm (https://s3.amazonaws.com/Citations/arkwright/Arkwight+Summit_SEIS2_Text.pdf); and (3) The Article 10 application for Cassadaga Wind Project (https://everpower.com/cassadaga-wind-project-ny/). In summary, as described in Section 14.16 of the FEIS, the final project designs for the Ball Hill Wind Project and Cassadaga Wind Project both include fewer turbines than had been proposed earlier. The projects together will have a smaller project footprint and less negative environmental impact, and thus less cumulative impact. Cumulative impacts to wildlife and other cumulative impacts are discussed in each project's submittals, and each project is subject to permitting reviews in which the permitting agencies are responsible for considering the cumulative impacts, both positive and negative.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Transportation			
SDEIS-0015-69	Chuck Luce	Where are these built, the windmills even installed?	The Vestas turbines are manufactured at a facility in Colorado and will be transported to the site in large pieces, as described in Section 2.11 of the SDEIS and Section 1.4.11 and Appendix M, Transportation, of this FEIS. Each turbine will be delivered by the manufacturer on up to 12 truck-loads including the blades, the nacelle, drive train, hub, cooer top, and the tower. Appendix M, Transportation, provides details on the size and weight of the cargo associated with each V126 turbine.
SDEIS-0015-71	Chuck Luce	Is that tower trucked in then in pieces or is it -- how many pieces does it come in?	Each turbine will be delivered by the manufacturer on up to seven truckloads. Each blade will arrive on a separate truck, the nacelle, drive train, hub, and cooler top, on separate trucks, and the tower will arrive in four separate sections. Appendix M, Transportation, provides details on the size and weight of the cargo associated with each V126 turbine.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
SDEIS-0015-72	Chuck Luce	A pretty good roadway to haul that up to the sites then.	Traffic associated with the construction of the Project would consist of delivery vehicles for turbine components, materials associated with turbine site construction and assembly, and personal vehicles for workers. Delivery vehicles would range in size from oversized load tractor-trailers (used to deliver tower sections, turbine nacelle, rotor blades, and cranes) to smaller vehicles, such as dump trucks, concrete trucks, fuel delivery trucks, vans, and pickup trucks. Personnel vehicles would consist of automobiles and light trucks. Some improvements to local roads and expansion of intersection turns would be required to facilitate the use of OS/OW vehicles. Details on roads likely to be used, types of OS/OW vehicles to be utilized and estimated numbers of OS/OW inbound loads are provided in Appendix M, Transportation, of this FEIS. No road traffic impacts are expected once the Project becomes operational.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Communication Surveys			
SDEIS-0015-48	Judy Phillips	It is upsetting to learn turbine blade rotation can cause loss of my over-the-air TV reception. That basically means that I use an antenna to receive TV signals. I asked the board to inquire and make public whether known weather signals are also disrupted.	The FEIS presents updated communication signal studies based on the Project layout, see Appendix K, Communication Surveys, of this FEIS as well as a summary in Section 1.4. While it is unlikely that the Project turbines would disrupt off-air television reception at a given location, if such disruption were to occur, residents could contact Ball Hill for assistance addressing the concern, as described in Appendix L, Complaint Resolution Plan, of this FEIS. With respect to impacts on weather signals, the commenter is correct, as it is known that the operation of commercial wind turbines can be interpreted as weather events on Doppler radar. While it is not known whether the Ball Hill wind turbines will show up on Doppler radar, radar technicians can take note of their presence and readily interpret them as non-weather phenomena.

Table 2.4-1 Ball Hill Response to Comments Received on the 2016 SDEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Land Use			
SDEIS-0015-33	Don Chase	What about vacant land you were planning to develop? Now the top of the thing is at four ninety-five and the total is four ninety-five where previously it was four twenty?	A shadow flicker analysis was conducted for the 241 existing structures identified within 4,134-feet of any turbines. The potential shadow impact could be calculated for other locations where new structures might be built. The shadow flicker analysis is presented in Section 3.6 of Appendix I, Visual Resource Assessment, of this FEIS and is summarized in Section 1.4 of the FEIS. The wind turbines that will be installed for the Project will be Vestas Model V126-3.45 MW IEC IIA/IIB turbines, each of which will have a capacity to produce approximately 3.45 MW of electricity. As described in the FEIS Section 1, the V126-3.45 MW turbine is a three-bladed, upwind, horizontal-axis wind turbine with a rotor diameter of approximately 413 feet. The nacelle is located at the top of the tower and contains the electrical generating equipment. The turbine rotor and the nacelle are mounted on top of a tubular tower giving a rotor hub height of 285 feet. The maximum height for the turbine is 492 feet when a rotor blade is at the top of its rotation.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Project Description and Design			
DEIS-0001-1	Public Service Commission	The description of the proposed Switch yard facility to be installed at the northern end of the transmission line is incomplete. The proposed Substation will step-up voltage from 34.5 kV to 115 kV via transformers. The 115 kV line will connect to the proposed Switchyard, which interconnects the overall Project to the existing 230 kV transmission line. The description of facilities in the DEIS does not indicate that an additional 115 to 230 kV step-up transformer is necessary at the proposed Switchyard. DPS Staff notes that the Preliminary Switchyard Site Plan (Drawing RP-SY-1, in DEIS Appendix A) indicates a transformer will be installed at the site.	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-3	Public Service Commission	The location of steel gas pipelines should be determined when planning the location of wind turbines and grounding systems, and electric collection and transmission lines. The DEIS identifies major gas transmission facilities, but does not identify the location of gas gathering lines. (See Fig. 2.23-3 -- Setbacks from Utilities.) Appropriate\ avoidance and mitigation measures to avoid induced voltages and lightning protection system grounding issues should be developed in project layout and detailed design. This is information that DPS requested in comments on the scope of studies appropriate for the project (as indicated at DEIS Appendix D, page D-87).	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0001-4	Public Service Commission	Substation site: The details indicated at Preliminary Substation Site Plan (Dwg. RP-SR-I) indicate the access road to the site is at a steep slope, with grade at approximately 10% at sections. The Substation site itself has a cross slope of I 0% with a long slope above. Siting the Substation should address provisions for cut and fill of slopes, site stabilization and compaction, and permanent drainage control features. The footprint of the substation will be larger to accommodate cut and fill slopes, unless retaining walls are installed at the indicated footprint. The uphill cut slope will intercept subsurface drainage; this should be addressed in permanent site drainage design, which should also address surface drainage for the site and the uphill slope and access road.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-5	Public Service Commission	Underground electric lines: Underground electric collection lines should be installed with provisions to avoid effects of subsurface "piping" of subsurface water creating and expanding voids around the electric cables running down steep slopes. Underground trench-breakers with surface water control features should be specified for underground lines installed on slopes.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-6	Public Service Commission	Switchyard site -- Drawing RP-SY-1: The access road to the proposed Switchyard appears to be located within a grape vineyard. Alternative locations should be investigated, in order to reduce or avoid the permanent reduction or displacement of productive grape vineyard acreage for access road installation.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0001-7	Public Service Commission	Transmission Line Plan and Profile -- Drawings BH-T301, Sheets I through 6: Transmission line clearance at road and railroad crossings should be specified in accordance with appropriate design standards and code requirements.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-8	Public Service Commission	Transmission line angle structure number 5 (Drawing BH-T301, Sheet 1) is proposed to be located within a NYS-regulated wetland (reference Appendix G, Wetlands Map Sector F). An alternative location for structure 5 to the south should be considered to avoid permanent impact to the wetland for location of the structure, as well as additional temporary impacts related to clearing for construction (including angle structure laydown and wire pulling at this location). (Note that this type of alignment appears to have been identified in an earlier project layout, as indicated in Appendix T, Figure 5.1.)	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-10	Public Service Commission	The Transmission Line Plan and Profile figures (as well as wetland and stream location figures in Appendix G) do not indicate locations of access roads for construction of the transmission facilities. Streams, ravines, wetlands and other features appear to create impediments to continuous through-access along the transmission line right-of-way. Access road locations, including off-right-of-way locations should be specified. Appropriate consideration of clearing, wetland fill, stream crossings, agricultural land practices, soils and slopes constraints, as well as erosion control and site stabilization measures for the access roads should be addressed within the EIS.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-2	Department of Agriculture and Markets	The Description of the Proposed Action section describes pad-mounted junction terminals which will be utilized to tie buried collector cables together into one or more sets of larger feeder conductors. Based on the Department's observation from the Applicant's other two working commercial wind projects in western New York, these junction boxes have, in several cases, presented a significant unanticipated impediment to field cropping patterns. The Project Applicant should provide more detail on the proposed placement of these junction boxes and graphically identify the locations for such facilities in agricultural fields. Locations of the junction boxes proposed in agricultural fields should be identified on the project drawings. This information should be made available to the Department for review purposes prior to the Town's acceptance of the FEIS, the Town's issuance of its Findings Statement and Permit.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017 and has, to the maximum extent practicable, limited impacts on agricultural land with micrositing practices. New York State Department of Agriculture and Markets (NYSDAM) did not provide public comment on the 2016 SDEIS. In addition, Figure 1 in Section 1 of this FEIS presents the FEIS layout of the Project including all Project Facility locations.
DEIS-0002-3	Department of Agriculture and Markets	Section 1.2.2 discusses a 3-acre off-site equipment staging area located along Route 39 near the intersection with Empire Road in Hanover. This proposed laydown area appears to be sited in an active agricultural field. If this area is to be used for laydown purposes, it should be constructed and restored in accordance with Department Guidelines.	Please see response to comment ID: DEIS-0002-2. Any temporary impacts to agricultural land would be restored using NYSDAM guidelines.
DEIS-0002-4	Department of Agriculture and Markets	On-site laydown areas are depicted on figure 1.1-2. The report indicates that the final locations will be identified in the FEIS. The identification of laydown areas in the FEIS does not allow the Department an opportunity to review potential impacts to agricultural resources and provide additional comments (if necessary). As a result, the Department requests that the laydown area locations be identified and the information be provided for review prior to the issuance of the FEIS.	Please see response to comment ID: DEIS-0002-2. Any temporary impacts to agricultural land would be restored using NYSDAM guidelines.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-5	Department of Agriculture and Markets	Section 1.2.2 discusses the installation of underground electrical collection lines and Right of-Way (ROW) widths. ROW widths will range between 22 feet for one circuit to up to 60 feet where four circuits will be installed in parallel. The Applicant proposes that the buried cables be installed along proposed access roads within a 60-foot ROW. Drawing No. BH-E- 103 (Typical Underground Trench Alignment) depicts collection schematic drawings. The schematics for three and four circuits show a "1 0-foot Buffer Work Access". Based on the Department's observations of construction activities on the Applicant's Wethersfield Windpark, greater ROW widths will be required in locations. Specifically, additional work space (ROW widths) will be required for the temporary stockpiling of topsoil. A ten- foot width linear temporary workspace is not adequate for the temporary storage (stockpiling) of topsoil removed to a minimum 8-inch depth from a 50-foot ROW. Linear topsoil stockpiles shall be appropriately coordinated with the placement/installation of underground collector cables (including other potential underground utilities) installed adjacent to access roads. Wider ROW widths will eliminate the need to handle stockpiled topsoil more than once; thus reducing the potential for additional soil resource impacts including topsoil subsoil mixing and soil compaction.	Please see response to comment ID: DEIS-0002-2.
DEIS-0002-6	Department of Agriculture and Markets	Section 1.2.2 discusses the installation of "ditch plugs" in wetlands for the purpose of preventing migration of shallow groundwater in linear excavations. Trench breakers are typically installed for the dual purpose of preventing trench washouts during construction and abating water piping and "blowouts" subsequent to trench backfilling. In this case, the installation of trench breakers in buried collector line trenches is critical due to the fact that the Project site is dominated by dense	Please see response to comment ID: DEIS-0002-2.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		glacial till and glacio-lacustrine soils. Penetration (excavation) will create a subsurface drainage envelope along the linear expanse of the trench unless such flows are alleviated or removed via miificial drainage from the trench. Thermal sand used as bedding will further exacerbate this condition. Because of this, the applicant should install trench breakers in agricultural fields in accordance with the spacing intervals as detailed on the Sample Drawing A-12 "Trench Breaker Spacing" (Attached). The Project Applicant shall also record each installed trench breaker location by map referenced station number. In agricultural lands, the top of trench breaker will not be closer than two feet from the restored surface. Additional subsurface drainage may be required following installation of buried electrical collector cables to effectively convey trench water to a stable surface outlet (see #26 below). Electrical collector cable runs will require close monitoring for evidence of seeps and waterboils during the 2-year monitoring period. Because of the proposed method of buried electrical collector cable installation (trenching), and the inherent difficulties associated with the installation of trench breakers during cable installation, the Department recommends that the Project Applicant closely monitor the toe of slope areas in agricultural fields for wet areas or signs of seeps and waterboils in cases where trench water is exfiltrating to the ground surface. If encountered, new interceptor drain lines should be installed in order to alleviate wet areas. The Applicant should make necessary provisions for post-construction drainage repairs in agricultural fields. Because of potential limitations on slope, topography and other surface features, it may be necessary to install drainage structures and correspond-	

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		ing outlets in locations outside of the Applicant's "permitted" ROW. The Department recommends that the Applicant make necessary arrangements with the Town, other Permitting Agencies and with individual landowners to allow for flexibility to install drainage features outside of the "permitted" ROW. In some cases, drainage easements may be required for off-ROW outlets.	
DEIS-0002-7	Department of Agriculture and Markets	The proposed project includes the construction of approximately 6 miles of overhead 115 kV transmission line; much of it located in active agricultural fields. While the project drawings show the general transmission line route, they do not depict temporary, or off right-of-way access routes to the proposed transmission line ROW. Project drawings should be revised by the Applicant (prior to issuance of the FEIS) to indicate exact locations and routes where off ROW access will be located. This will allow Department Staff the ability to identify and assess potential impacts (if any) to active agricultural fields utilized for off ROW access.	Please see response to comment ID: DEIS-0002-2.
DEIS-0002-8	Department of Agriculture and Markets	Drawing RP-SY-1 shows the switchyard access road crossing through what appears to be an active vineyard. In accordance to Department Guidelines, unique agricultural lands, i.e., specialty croplands, orchards, vineyards, etc. should be avoided. Avoidance routing should be explored in order to reduce or avoid permanent impacts (conversion to non-agricultural use) to the active vineyard from access road construction.	Please see response to comment ID: DEIS-0002-2.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-9	Department of Agriculture and Markets	Some sections of the off right-of-way access roads are likely to utilize existing farm access paths. The majority of which are located along field edges that are typically utilized infrequently by the farm operator for field access. Unless the proposed off right-of-way access route is a well-defined farm road (i.e., heavily compacted, no vegetation, gravel or crushed stone surface etc.), topsoil stripping or timber matting shall be required. Unless "tractor paths" or "unimproved roads" appear like the farm driveway, they should be treated the same as an agricultural field. Anything that is determined to be a legitimate or clearly defined farm road should be restored to at least original condition. Under no circumstances should the right-of-way clearing crews or electrical contractor be allowed vehicle/equipment access onto or along agricultural fields (including field edges, or unimproved tractor paths) without first stripping the topsoil (or through the use of timber matting). All construction activities in agricultural fields, including equipment and vehicle access for clearing, shall be conducted on topsoil stripped or timber matted travel and work areas. If questions arise as to the designation of, or status of the proposed use of field edges, "unimproved roads", or "tractor paths" for vehicle and equipment access, the Department shall be notified and the area in question will be field reviewed by Staff and a mutual determination will be made prior to construction.	Please see response to comment ID: DEIS-0002-01.
DEIS-0002-11	Department of Agriculture and Markets	At the end of construction on the transmission line, the ROW and respective work areas, including guying wire assembly and disassembly sites, shall be thoroughly cleared of construction debris such as nuts, bolts, spikes, wire, etc.	Please see response to comment ID: DEIS-0002-2.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-12	Department of Agriculture and Markets	Page 1-17 of the DEIS discusses access road construction and the installation of culverts to "maintain a water table elevation below the base material to ensure roadbed stability". According to this Section, roadside ditches will be constructed as dictated by the terrain to convey stormwater runoff away from roadways. Culverts, fords, roadside ditches or other stormwater collection and conveyances should not be constructed so as to allow direct discharge into active agricultural fields. Culverts and other water conveyance devices should be designed and implemented to divert flows away from active agricultural areas into existing or new water conveyance systems (i.e., drainage ditches, grassed waterways, swales, diversion ditches or other appropriate water control structures).	Please see response to comment ID: DEIS-0002-2.
DEIS-0002-14	Department of Agriculture and Markets	Section 2.4 discusses potential construction impacts on site soils. The section describes a 5- acre O&M facility for which a final location is unknown at this time. The DEIS states that the final location and impacts will be identified in the FEIS. Inclusion of this information in the FEIS does not allow the Department sufficient opportunity to thoroughly review the potential impacts to agricultural resources and provide additional comments (if necessary). As a result, the Department requests that potential locations be provided for review prior to the issuance of the FEIS.	Please see response to comment ID: DEIS-0002-2.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-19	Department of Agriculture and Markets	Section 2.4.2 describes the potential for permanent impacts associated with project -related facilities on agricultural lands and the total acreage of prime farmland and farmland of statewide importance that will be permanently impacted by the proposed Project through conversion to non-agricultural uses. The consultant for the Applicant states that the conversion of these agricultural soils is "minimal and will not significantly affect these soil resources in the Towns and county". While these acreages may appear to be minimal to the DEIS preparer, facilities such as permanent gravel crane pads, junction boxes, guying wires, permanent access roads and, in some instances, improperly designed and implemented stormwater practices can present significant adverse affects to the long-term viability of farm operations in the Project area. Construction of these facilities can create serious impediments to established field cropping systems, field access and drainage patterns. These potential impacts should be included in this section and discussed in more detail in the FEIS.	Please see response to comment ID: DEIS-0002-2.
DEIS-0002-21	Department of Agriculture and Markets	Section 2.4.3 discusses mitigation activities. The section states that impacts to agricultural lands will be minimized by restricting project ·equipment and access to the approved construction ROW. The Department requests that the Project Applicant provide a more detailed description of the anticipated methods intended to restrict equipment access to nonapproved (active agricultural) areas of the project site during construction.	Please see response to comment ID: DEIS-0002-2.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-25	Department of Agriculture and Markets	Section 2.27.5 discusses the installation of collection system components. This section should include a more detailed description of the need for placement of collector system junction boxes in active agricultural fields. Because of the potential adverse impacts these junction boxes pose to the viability of farm operations in the project area, the Applicant should, to the fullest extent practicable, locate these above ground junction boxes outside of active agricultural areas.	Please see response to comment ID: DEIS-0002-2.
DEIS-0002-26	Department of Agriculture and Markets	In Section 2.4.3, subsurface drainage is discussed. The Section states that "New subsurface drain lines will meet or exceed the condition of existing installed structures ... " In accordance with Department Guidelines, new subsurface drain lines shall be AASHTO M252 single wall drain line or equivalent and shall be installed in accordance with the applicable USDA Natural Resources Conservation Service (NRCS) Conservation Practice Standard for "Subsurface Drain" (608). F405 may not be used in agricultural lands for this drain tile application. Tile outlets shall be constructed of Schedule 80 PVC and steel animal guards should be installed far enough in the pipe to allow it to swivel up and let debris pass without exposing the animal guard beyond the pipe outlet. A "splash rock" should be installed beneath the pipe outlet to dissipate the erosive forces of the discharge water from the drain tile and to prevent additional scouring from occurring beneath the outlet. Installation of substandard materials may warrant the removal and replacement with the required materials identified above. Department field staff should be notified when existing subsurface drain lines are first encountered during construction and also be notified in advance to witness drain tile repair activities.	Please see response to comment ID: DEIS-0002-2.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-3	Diana Robinson	Is their a guaranteed market for the power especially in light of lower oil/gas prices, new clean coal technology and the abundance of natural gas.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017.
DEIS-0004-4	Diana Robinson	We are concerned that Noble was under investigation by NYS attorney general's office and also that the attorneys retained by Noble are "criminal case" attorneys.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017.
DEIS-0004-5	Diana Robinson	What would happen if Noble sells out to another company? Is there any bond or assurance that the next company will be compliant to the original agreement?	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017.
DEIS-0004-15	Diana Robinson	Additionally, it should be noted that T-4 is shown to be located within a 500 ft distance of a residence not shown on the master map and located on a property that is less than 50 acres. We were told by a Noble representative (Tim Marvich) that owners must have at least 50 acres to have a wind turbine. This is also the turbine of greatest concern to us being the closest for noise, causing the greatest degree of shadow flicker, and affecting our primary view.	Please see responses to comment IDs: DEIS-0004-08 through DEIS-0004-10.
DEIS-0004-17	Diana Robinson	*Mitigation .. the only realistic mitigation for us is setback distance due to noise, shadow flicker, health, primary view affected along with domination of the general landscape 360 degrees seven days a week for many years to come. Our particular property) due to our location being at the highest elevation on Round Top Rd and the openness surrounding our residence, will be adversely affected whether we remain as residents or choose to sell. I know of no other property in the project that will be affected as greatly as ours. It should also be noted prevailing winds come from the west of our house with the closest of turbines T2, T3, and T 4 in line with the prevailing winds and our home.	There are zero residences within 1,200 feet of a turbine in the FEIS Layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-18	Diana Robinson	*Setback for permanent residences should be reconfigured to .96 mile (5068 ft.) Note; Even for only half the distance or a .50 mile (2640 ft) the following turbines near our home would have to be disallowed: T-2 (2500 ft), T-3 (2000 ft), T-4 (1200 ft) T·5 (2000 ft), T-7 (1500 ft).	There are zero residences within 1,200 feet of a turbine in the FEIS Layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0004-19	Diana Robinson	*T-4 should not be allowable. There is a residence within 500 feet not shown on master map Figure 2.23 - 2 Setback Map. This is too close a proximity whether a seasonal or permanent residence. And, this property is less than a fifty acre parcel.	There are zero residences within 1,200 feet of a turbine in the FEIS layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0004-20	Diana Robinson	*Set back -distance for seasonal homes should be established due to health concerns, blade failure, ice on blades etc.	There are zero residences within 1,200 feet of a turbine in the FEIS layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0004-21	Diana Robinson	*Our frontage is incorporated within T-4's 1000 ft. setback circle. This would be a detriment to our building a home or selling lots along our road frontage.	There are zero residences within 1,200 feet of a turbine in the FEIS layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0004-24	Diana Robinson	* Research multiple options, such as the new wind silos, geothermal, etc. Obtain some competing studies for our township and then choose direction.	Section 1 of this FEIS outlines the proposed Project layout for this Project.
DEIS-0004-25	Diana Robinson	• Negotiating - take plenty of time to ensure full compensation for a project that will drastically change our area for many years to come. There are always other options.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0005-1	Kathryn McGraw	We are off-site Bartlett Hill Road property/home owners who will be directly impacted by the Ball Hill wind turbines. Specifically, T45 will be located only 1075' from our house and less than 1000' from other portions of our property according to information found on Noble's website. Having researched wind turbines and their impacts on nearby residents and having visited the Bliss windpark, it is our informed opinion that a minimum setback of 1000' is very inadequate. Our property will be impacted visually and by the noise and flicker associated with 400' wind turbines sited so closely. We request that T45 be positioned further south so as to increase its distance from our house.	There are zero residences within 1,200 feet of a turbine in the FEIS layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0006-2	JD Robinson	My first comment or question/comment would be we live on Round Top and we have several turbines that are listed on the maps that we looked at in the books, but we find a discrepancy as to how many turbines would be across the road from us. And we wonder if we can get that cleared up at some point, whether you know for sure, yourselves, or anyone here knows.	Figure 1 in Section 1 of this FEIS presents the FEIS layout of the Project including all Project Facility locations.
DEIS-0006-7	JD Robinson	Do we have a way of plans of transitioning from one company to another should Noble go into bankruptcy or they just want to sell out to another company where the things that have been planned out carry across to the next company?	Mr. Spitzer responded directly to this comment during the October 30, 2008, public hearing and stated: "The law that was passed by this town requires that they get approval for any transfers of the company and the basic requirement is that the new company assume the obligations of the old. For the decommissioning for the security. It's up to them to propose something. Usually it's a bond, but it could be a letter of credit." The updated Project Decommissioning Plan is included in the FEIS as Appendix R.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-8	JD Robinson	The next question is, the snowmobile trails. We have one that runs the perimeter of the back of our property, around the 50 acres that we own and comes out towards the front. I just wanted to know what the effect is here with the turbines, whether there is a setback distance to the trails or snowmobile riders. I know we talked at the last meeting, we mentioned about ice coming off the turbine blades and even a possibility of the failure. And these things run through the woods, I assume ii would be, you know, all season.	Mr. Spitzer responded directly to this comment during the October 30, 2008, public hearing and stated: "The law [wind law] does not have a setback requirement for the snowmobile trails." This FEIS presents the updated Project layout for Town and public review. Ball Hill provided an updated Ice and Blade Throw Analysis in the Amended Application to the Town of Villenova in September 2016, which states that "Implementation of best practices safety procedures during operation of the wind farm can reduce the risk of ice throw, including, but not limited to: visual inspections, de-icing and anti-icing systems, regular and routine maintenance by full-time turbine technicians assigned to wind farm operations, curtailment of turbines in hazardous conditions, educating staff/landowners on specific weather conditions and associated throw risks, standard safety protocols where icing is imminent, and public safety warning signs near public areas and project boundaries." The buildup of ice on the blades impacts the ability of the turbine to function as designed. The weather conditions and decreased turbine performance will be observed in the SCADA center and the identified turbine or turbines will be adjusted to avoid or minimize both ice throw and damage to the turbine itself.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-11	JD Robinson	We have a view of Prospect, Pope Hill, and then we're on Round Top, so we're going to be surrounded. So we're going - the back of our house, we look out and we see Pope Hill and Prospect. They are farther away from Round Top. But on Round Top we look out the front, we're going to be surrounded by them. You know, people would say you are for it and we are for this project. But, you know, they are going to say, well , they might say, yeah, but not in your backyard, right? It's not just our backyard, it is our front yard, our side, it's 360 degrees for us plus the flicker effect. Se we are definitely concerned about it, especially what's going to be across the street from us, the five or six turbines. And again, too, we're year round residents. Some people that own property that will maybe have turbines maybe are not even full-time residents. They are just here and gone off for hunting, whatever. So I guess that's pretty much the gist of it for us. We tend to object to the turbines across the road from us on the west side. The rest of the Project I think we could live with but that kind of sums it up for us.	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment of this FEIS.
DEIS-0006-22	Dana Bennett	Another thing I have, now this is from the Internet, something that Glen Cramer, a councilman from Sheldon, had mentioned. l don't know who did the wind farm out there (Invenergy). But it said that they brought in 2,000 loads of industrial waste from Bethlehem Steel and worked it into the thousands of other loads of crushed stone. I want to know, did that happen? Can that happen here?	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017.
DEIS-0006-24	Diana Ermer	I had heard that there is something -- that Noble was being investigated by the Attorney General's office of New York State. Do you know anything about that.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-27	Nadine McCarthy	It was just the -- about the noise and people don't like what they look like. The generators. l just -- I had a lot of questions and what the revenue was going to be from them. And actually the first fellow that I talked to, I got different answers from him than the second person that came around. And the second person when I told him, what about ~- well, you're way lower than the first guy. He shook his head and said, well, we don't have those kind of turbines up there. Those are bigger ones that are going to generate that kind of revenue. So it was like, I'm thinking, you guys are not on the up and up. You seem like you are kind of scamish or something and you are already out of the Fredonia office, so from -- And then when we make phone calls, you don't get return calls. And you hear the beep on the answering machine that they must have several. And then the response is, when you do get a call back, well, I'm busy going around on other projects. I don't like as a business how they deal with people and the landowners. And, again, there's specific landowners that have to deal with this and J think they should be compensated somehow. And whoever said the fair - the good neighbor agreement or something just because you're being inconvenienced. And not to be compensated, l think is wrong. And the people who are pushing for it, don't see that. Their properties are not affected by it other than the fact they might get a tax break or something, but they are not dealing with these things right in their back door.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns. As detailed in Appendix J, Sound Level Assessment Report, of this FEIS sound produced by the wind turbines may be audible at times, but would be within the sound-level limits approved by the Town of Villenova. For more details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-28	Robert Barnes	I'm Robert Barnes. I live on Pope Hill Road. I would say for probably 15 years we love our farm. We love the area. And I can tell some of the people that we're -- we're -- I researched it for about a year because our property is included. so -- and it sounds like the Town will be making a little bit more than us, which is fine, you know, because they disburse it around. And another reason I was glad about this was because, not apart from money, but aesthetically a lot people don't think about this, but I lived in West Valley for 14 years and all the farms there were cut up into little parcels. And everyone has a dog. Everyone has got noisy cars. And this will actually really benefit all the fanners becau.se you'll have a little bit extra income and it is hard to make.-- I'm trying to make money as a fanner. And all my neighbors are trying to make money as fanners. We won't have to sell off five acres to pay the taxes. Taxes in New York State, for the same sized farm, they are $850 for 150 acre farm for the school and the Town tax-es. And out here, I won't have to tell you that it will probably be a lot more than that. Ten times that. All the farm that I've talked to, not just including this one, but they are all very happy for it. Even people who have lived in the country a long time, I know that people -- it sounds like the people that lived in the city that came out here are the ones that are opposed. But the people that, you know, were born and bred here, you know, just keep that in mind. It's actually going to help keep the landscape fanning. And they are not very close together. I've been to Bliss. I have a hard -- you can usually only see -- just a few places you can see more than ten at that time.	Figure 1 in Section 1 of this FEIS presents the FEIS layout of the Project including all Project facility locations. Ball Hill is responsible for negotiating lease agreements with property owners on whose properties project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective Towns.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-29	William Eaton	I'm William Eaton. I am from Cattaraugus. I own property up here on the Villenova Road and Round Top Road, 120 acres. I am wondering if they acquired the transfer line property that goes out to the transfer station? Has it been sited for the roadways that go to the turbines? ls there a map that's been produced for roadways that go to the turbines? Where would l get that?	Figure 1 in Section 1 of this FEIS presents the FEIS layout of the Project including all Project Facility locations. Ball Hill is responsible for negotiating lease agreements with property owners on whose properties project facilities will be constructed.
DEIS-0006-33	Christine Easterly	Christine Easterly. I live over on Dybka Road. Why Round Top? Why out of all the areas -- why a north hill versus south hill? I get just as much wind up there as I am sure they get up on that Hill	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017. Figure 1 in Section 1 of this FEIS presents the FEIS layout of the Project including all Project Facility locations.
DEIS-0006-34	Unidentified	Maybe what I can say is.. they are worried because their hill is being ignored, but one hill at a time. I've heard rumors of a possible project going on the other side of the valley so, but just because Pope Hill has it or some of Round Top has it, doesn't mean they won't someday in the future want to put windmills on another hill.	The 2016 SDEIS and this FEIS address cumulative impacts from this Project and other wind farms in the surrounding area. For additional details see Section 4 of the 2016 SDEIS and Section 1.4.16 of this FEIS.
DEIS-0006-35	Dana Bennett	ls there going to be a point where Chautauqua County is going to say that's enough wind turbine projects and stuff like that? I mean, because a big basis on Chautauqua County is tourism. You know, how is this going to affect tourism? And is there going to be a point where Chautauqua County is going to say we have enough?	Mr. Spitzer responded directly to this comment during the October 30, 2008 public hearing and stated: “The way New York State Law currently works is zoning is handled solely at the local level and the County does not have veto power.”

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Socioeconomics			
DEIS-0002-1	Department of Agriculture and Markets	The Executive Summary states that "The minimal loss of productive agricultural land will be offset by the financial benefits the landowners will obtain from payments they will receive from Noble for their participation in the Project". Although funds received by the landowner (farmer) may benefit the current agricultural enterprise, monetary compensation does not constitute a valid justification for the permanent loss or conversion of agricultural land. In most cases, monetary compensation will not prevent permanent conversion of agricultural land to a non-agricultural land use.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017 and has, to the maximum extent practicable, limited impacts on agricultural land with micrositing practices. NYSDAM did not provide public comment on the 2016 SDEIS. In addition, Figure 1 in Section 1 of this FEIS presents the FEIS layout of the Project including all Project Facility locations.
DEIS-0004-1	Diana Robinson	Is adequate amount of bond money being required per tower for tear down costs? We do not believe $20, 000 per tower will be adequate for the future even with recycling of parts, say 10·20 years from now.	The updated Project Decommissioning Plan is included in this FEIS as Appendix R.
DEIS-0004-2	Diana Robinson	Will Noble be able to get adequate financing to complete the project in today's economic climate? The company that is doing their financing, Babcock & Brown is understood to be struggling.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-8	Diana Robinson	The change to home and property value is also of greater concern for us.	An assessment of the potential effects of the Project on property values from a wind project is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to being in proximity or in the viewshed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad based value effects have occurred in those markets. Please refer to Appendix Q for additional information.
DEIS-0004-10	Diana Robinson	This along with the noise and health affects will be a great detriment to us in the enjoyment or sale of our property considering the number and close proximity of proposed turbines.	Please see responses to comment IDs: DEIS-0004-08 through DEIS-0004-10.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-16	Diana Robinson	At this time in the process we have no assurance of any benefit for us or the community in general. We ask you not to come to an agreement too quickly, but to ensure the community is duly compensated for this major und~ We hope that the community in general will be compensated with taxes eliminated I paid or such as was done for the community in Eagle. This will help somewhat with property value concerns. All people in the community and especially those permanent residents in the wind park area will be greatly affected by this project and should be compensated proportionately. All the community of owners must benefit reasonably from this project!	Thank you for your comment.
DEIS-0004-21	Diana Robinson	*Our frontage is incorporated within T-4's 1000 ft. setback circle. This would be a detriment to our building a home or selling lots along our road frontage.	There are zero residences within 1,200 feet of a turbine in the FEIS Layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project Facilities.
DEIS-0004-22	Diana Robinson	*All community property owners must benefit since all would be affected, whether "signed on" with Noble contracts or not.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
DEIS-0004-23	Diana Robinson	* Permanent residents be given commensurate consideration and benefit.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective Towns.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-25	Diana Robinson	• Negotiating - take plenty of time to ensure full compensation for a project that will drastically change our area for many years to come. There are always other options.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
DEIS-0006-4	JD Robinson	In lieu of the economy and the things that are happening now with the banks going out of business, you know, the financing just in turmoil, is this project something the financing has already been secured? Could it have - have we looked at the possibility that it may just change all of a sudden over the next year when they just start building? Is that money actually going to be there for the duration to complete the project? I was wondering how secure it was that they would have the financing or if they could even offer that at this point. Do they have a backup plan is maybe what I should be asking.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-6	JD Robinson	Just to comment also in conjunction with the finance, financibilities of what's going on. In talking with the attorney, he talked about oil, gas prices being so much lower. Does it make sense to do turbines? Tax credits that either Noble is depended on bond and the guaranteed market for power? Those -- those are some of the other factors of the economy that should be considered. Especially for them, but also for us. Does it make it a viable project?	Mr. Spitzer responded directly to this comment during the October 30, 2008, public hearing and stated: "We don't have a right to say yes or no to any business based on the economics. The fact of the matter is, I hear these things at hearings all the time. Gee, these things don't make money. Nobody builds a two hundred million dollar project that isn't intended to make money... If you're looking at these projects in terms of whether they make sense, the fact of the matter is that New York State has said it wants renewable energy and will pay more for renewable energy and that's really what's driving the wind energy industry in New York. So even if the Town really thought that this is a terrible time to build this kind of project, it is not our call. What we can look at is, what are the economic, environmental, and social impacts together. The project may finish environmental review and then never get built. It's not the Town's responsibility to have a Plan B." This FEIS presents the updated Project layout for Town and public review.
DEIS-0006-10	JD Robinson	Our feeling on the community as a whole benefiting, we're hoping that there is something that is there for all the community, not necessarily just the people who have been able to have the turbines. It does affect the whole community. I wonder if anything had been secured or determined in that direction.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
DEIS-0006-17	Dana Bennett	Another question I have, you said it was a 200 million dollar project. Percentage-wise, what of that is coming from the Federal and from the State?	Mr. Spitzer responded directly to this comment during the October 30, 2008, public hearing and stated: "None of it will come from federal of state. All the credits will be paid based on generation."

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-18	Dana Bennett	$8,000 per mW - is that what the towns are looking at - or the county is looking at getting per tower.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
DEIS-0006-19	Dana Bennett	As far as being split, how much will actually go to our community?	Mr. Spitzer responded directly to this comment during the October 30, 2008, public hearing and stated: "The IDA fee is totally separate that the offers of money to the community. And how much each town, school, and community gets, that's the subject of - basically arm wrestling that is ongoing as to how the entities will split it up."
DEIS-0006-20	Howard Crowell	Down in Castile, they did away with the taxes after their windmills were put in their township.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective Towns.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-21	Dana Bennett	Another thing I want to bring up is, Noble says it will not negatively effect property values. I really don't see how that can happen. If I go to sell my house, I'm going to have a number of people come to look at that. A certain number of people are going to be turned away because they don't want to live next a wind farm, you know? So fewer people, that means the price of that house is going to go down to sell it.	An assessment of the potential effects of the Project on property values from a wind project is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence which would indicate any impact or potential impact on residential real estate values in the market area analyzed due to being in proximity or in the view shed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad based value effects have occurred in those markets. Please refer to Appendix Q for additional information.
DEIS-0006-25	Norris Nobles	I was wondering, I have always been a union man. Are you using jobs? Using the union or union labor?	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017 and intends to utilize the local labor force to the maximum extent practicable.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-26	Nadine McCarthy	My name is Nadine McCarthy and I live in Forestville, but I also own property on Round Top. So I agree with this gentleman with the lack of notification to landowners;. I also agree with his concerns for the visual impact because I too brought - bought the property because I loved the view and just the nature up there. And I rode to Bliss. And I didn't like how it looked and it was very upsetting 10 me. And some of my concerns too are more directed towards Noble which I don't have to get into tonight, but when I did address some of my concerns and ask questions, well, the response was always, go to Bliss or Arcade. I'm thinking, well, take me there or something. You know, don't just throw that out. That's not the way -- you don't deal with people that way, if you're on the up. I don't know. For a business, I thought that was kind of a poor approach or response. If the community benefits, that's a great thing. But yet, again, my concern was that this wasn't my intention for the property to look at what I'm going to have to be looking at and dealing with. So it's a disappointment to me that way and I hope down the line if I have to sell the property, I can sell it and benefit from the sale, but right now I am very disappointed. And I was hoping to retire up there and enjoy it. But at this point in time I don't think that was going to happen. I don't have anything else to say, but I just wanted to agree with him.	Please see response to comment ID DEIS-0006-12 for details on the public participation effort for the 2016 SDEIS. Copies of the public notices are included in this FEIS in Appendix T, Public Participation. The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment of this FEIS. In addition, an assessment of the potential effects of the Project on property values from a wind project is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to being in proximity or in the viewshed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad-based value effects have occurred in those markets. Please refer to Appendix Q for additional information.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-27	Nadine McCarthy	It was just the -- about the noise and people don't like what they look like. The generators. I just -- I had a lot of questions and what the revenue was going to be from them. And actually the first fellow that I talked to, I got different answers from him than the second person that came around. And the second person when I told him, what about ~- well, you're way lower than the first guy. He shook his head and said, well, we don't have those kind of turbines up there. Those are bigger ones that are going to generate that kind of revenue. So it was like, I'm thinking, you guys are not on the up and up. You seem like you are kind of scamish or something and you are already out of the Fredonia office, so from -- And then when we make phone calls, you don't get return calls. And you hear the beep on the answering machine that they must have several. And then the response is, when you do get a call back, well, I'm busy going around on other projects. I don't like as a business how they deal with people and the landowners. And, again, there's specific landowners that have to deal with this and J think they should be compensated somehow. And whoever said the fair - the good neighbor agreement or something just because you're being inconvenienced. And not to be compensated, l think is wrong. And the people who are pushing for it, don't see that. Their properties are not affected by it other than the fact they might get a tax break or something, but they are not dealing with these things right in their back door.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns.
Visual Resources			
DEIS-0001-13	Public Service Commission	Manufacturer's cut sheets should be provided, which specify lighting illuminance levels and pattern, and which list features as discussed above regarding light cutoff, shields, and optic criteria.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-27	New York State Department of Environmental Conservation	**Visual resources.** DEC Visual Policy, *Assessing and Mitigating Visual Impacts*, DEP-00-2, July 31, 2000, defines an aesthetic impact as that which occurs when there is a detrimental effect on the perceived beauty of a place or structure identified as a significant scenic or aesthetic resource. Significant aesthetic impacts are those that may cause a diminishment of the public enjoyment and appreciation of an inventoried resource, or one that impairs the character or quality of such a place. For each potentially affected resource identified, a determination should be made as to whether visibility of one or more turbines result in diminished public enjoyment or appreciation of the resource, or impairs its character or quality. This determination should be made on the basis of existing visual settings of the inventoried resource and the likelihood that visibility of the proposed project will compromise the existing setting and diminish public enjoyment of that resource.	The updated Project and potential impacts (including an updated VRA, see Appendix I of this FEIS) were outlined in the SDEIS, which the NYSDEC submitted public comment on. The updated Project has considered these and a direct response to NYSDEC's comment on the SDEIS is in Table 2.4-1.
DEIS-0003-28	New York State Department of Environmental Conservation	While visual simulations were accomplished from resources of statewide significance within the APE, simulations should also be considered, if visual impacts are judged to be probable, for trail overlooks within the Harris Hill State Forest, from Evangola State Park, and from the Seaway Trail. These locations are of high importance to the public and could be potentially impacted by the project.	Please see response to comment ID 0003-27.
DEIS-0003-29	New York State Department of Environmental Conservation	In accordance with DEC Visual Policy, screening should be considered as an option to mitigate visual impacts. Direct mitigation options, when feasible, should be applied such as screening or selective turbine relocation. Offsets should be employed when other types of mitigation would be uneconomic or only partially effective.	Please see response to comment ID 0003-27.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-6	Diana Robinson	The change to the landscape and aesthetics will affect us daily.	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment of this FEIS.
DEIS-0004-9	Diana Robinson	Additionally, we would be subjected to the highest degree of visual impact, 360 degrees from any window or viewpoint around the house, front yard, back yard and side yard due to the openness and position of our property. Unfortunately, we would also be subjected to a very significant amount of flicker during sunrise. I'm.4 sunsets too.	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS.
DEIS-0004-11	Diana Robinson	These thirteen wind turbines, would be in our line of sight; adding noise, dominating the view whichever way we look. Twelve of these thirteen wind turbines would be close enough to have a multiple audible affect The closest would be just over 1000 ft. Many more would only be 1500 to 4000 ft. distance.	Please see responses to comment IDs: DEIS-0004-08 through DEIS-0004-10.
DEIS-0004-17	Diana Robinson	*Mitigation .. the only realistic mitigation for us is setback distance due to noise, shadow flicker, health, primary view affected along with domination of the general landscape 360 degrees seven days a week for many years to come. Our particular property) due to our location being at the highest elevation on Round Top Rd and the openness surrounding our residence, will be adversely affected whether we remain as residents or choose to sell. I know of no other property in the project that will be affected as greatly as ours. It should also be noted prevailing winds come from the west of our house with the closest of turbines T2, T3, and T 4 in line with the prevailing winds and our home.	There are zero residences within 1,200 feet of a turbine in the FEIS Layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-5	JD Robinson	Where we're located, we've got turbines going up in the sunset area of the front porch. It will even be multiple turbines across the road from us. My wife's looked through the initial study, through the books, and there's a flicker effect. And she saw that it's rated the highest - it was up to 40. Well, it was greater than 40. Who knows what greater than 40 is. But it's 1200 feet away from us and the view of the sun. We're not real happy about that. We're just wondering what the actual amount would be rather than greater than 40. Can we get an actual amount? A real time estimate of what it would be?	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS.
DEIS-0006-11	JD Robinson	We have a view of Prospect, Pope Hill, and then we're on Round Top, so we're going to be surrounded. So we're going - the back of our house, we look out and we see Pope Hill and Prospect. They are farther away from Round Top. But on Round Top we look out the front, we're going to be surrounded by them. You know, people would say you are for it and we are for this project. But, you know, they are going to say, well , they might say, yeah, but not in your backyard, right? It's not just our backyard, it is our front yard, our side, it's 360 degrees for us plus the flicker effect. Se we are definitely concerned about it, especially what's going to be across the street from us, the five or six turbines. And again, too, we're year round residents. Some people that own property that will maybe have turbines maybe are not even full-time residents. They are just here and gone off for hunting, whatever. So I guess that's pretty much the gist of it for us. We tend to object to the turbines across the road from us on the west side. The rest of the Project I think we could live with but that kind of sums it up for us.	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-13	Dana Bennett	I moved into the area eight years ago from Tonawanda. I wanted to get out of the city and now all of a sudden the city's following me out here. It's -- I've done some research into it. I tried to go into it with an open mind. The more l look into it, the more l don't want it there. And like I said, everybody has a right to their opinion. I do too. Like I said, the one thing is a major visual impact. According to your books, from my house I'll be able to see 42 out of the 60 turbines. The closest one will be just a hair over half a mile from my house.	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS.
DEIS-0006-15	Dana Bennett	I don't believe this blends with the country atmosphere that we have out here. The reason that I moved out here. Even in the ad when I bought my house, it mentioned the beautiful views. That's why I bought my house. That's what brings me peace and happiness at my house and this is going to drastically change that. Whether you are for it or against it, it's going to drastically change.	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS.
DEIS-0006-16	Dana Bennett	I believe that a person has the right to do what they want with their property until it crosses the line of how somebody else can enjoy their property.	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-26	Nadine McCarthy	My name is Nadine McCarthy and I live in Forestville, but I also own property on Round Top. So I agree with this gentleman with the lack of notification to landowners;. I also agree with his concerns for the visual impact because I too brought - bought the property because I loved the view and just the nature up there. And I rode to Bliss. And I didn't like how it looked and it was very upsetting 10 me. And some of my concerns too are more directed towards Noble which I don't have to get into tonight, but when I did address some of my concerns and ask questions, well, the response was always, go to Bliss or Arcade. I'm thinking, well, take me there or something. You know, don't just throw that out. That's not the way -- you don't deal with people that way, if you're on the up. I don't know. For a business, I thought that was kind of a poor approach or response. If the community benefits, that's a great thing. But yet, again, my concern was that this wasn't my intention for the property to look at what I'm going to have to be looking at and dealing with. So it's a disappointment to me that way and I hope down the line if I have to sell the property, I can sell it and benefit from the sale, but right now I am very disappointed. And I was hoping to retire up there and enjoy it. But at this point in time I don't think that was going to happen. I don't have anything else to say, but I just wanted to agree with him.	Please see response to comment ID DEIS-0006-12 for details on the public participation effort for the 2016 SDEIS. Copies of the public notices are included in this FEIS in Appendix T, Public Participation. The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS. In addition, an assessment of the potential effects of the Project on property values from a wind project is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence that would indicate any impact or potential impact on residential real estate values in the market area analyzed due to being in proximity or in the viewshed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind farms have been developed that no broad-based value effects have occurred in those markets. Please refer to Appendix Q for additional information.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-27	Nadine McCarthy	It was just the -- about the noise and people don't like what they look like. The generators. I just -- I had a lot of questions and what the revenue was going to be from them. And actually the first fellow that I talked to, I got different answers from him than the second person that came around. And the second person when I told him, what about ~- well, you're way lower than the first guy. He shook his head and said, well, we don't have those kind of turbines up there. Those are bigger ones that are going to generate that kind of revenue. So it was like, I'm thinking, you guys are not on the up and up. You seem like you are kind of scamish or something and you are already out of the Fredonia office, so from -- And then when we make phone calls, you don't get return calls. And you hear the beep on the answering machine that they must have several. And then the response is, when you do get a call back, well, I'm busy going around on other projects. I don't like as a business how they deal with people and the landowners. And, again, there's specific landowners that have to deal with this and J think they should be compensated somehow. And whoever said the fair - the good neighbor agreement or something just because you're being inconvenienced. And not to be compensated, l think is wrong. And the people who are pushing for it, don't see that. Their properties are not affected by it other than the fact they might get a tax break or something, but they are not dealing with these things right in their back door.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective Towns.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-32	Diana Ermer	Diana Ermer again. I may have - we moved here a little over nine years ago, but I'm not a city person. I just want to clarify that. I'm not a native from Villenova, but I've always lived in the country and grew up on the farm and I don't want to sound, you know, like a nimby, not in my backyard, but that's - I just wanted to let people know that. I mean, we moved out- we loved the view. We loved the house. We fell in love with it sitting on the front porch the day we came to look at it. I've always lived in the country, but I lived in the flatlands. And I loved that when I came out here, I was like, oh, this is so beautiful. I can see the lake, I can, you know, it was just like heaven. But anyway - just - I'm not a city person. Not that there's anything wrong with city people moving out, but just to kind of let them know that.	The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS.
Soils			
DEIS-0001-10	Public Service Commission	The Transmission Line Plan and Profile figures (as well as wetland and stream location figures in Appendix G) do not indicate locations of access roads for construction of the transmission facilities. Streams, ravines, wetlands and other features appear to create impediments to continuous through-access along the transmission line right-of way. Access road locations, including off-right-of-way locations should be specified. Appropriate consideration of clearing, wetland fill, stream crossings, agricultural land practices, soils and slopes constraints, as well as erosion control and site stabilization measures for the access roads should be addressed within the EIS.	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-5	Department of Agriculture and Markets	Section 1.2.2 discusses the installation of underground electrical collection lines and Right of-Way (ROW) widths. ROW widths will range between 22 feet for one circuit to up to 60 feet where four circuits will be installed in parallel. The Applicant proposes that the buried cables be installed along proposed access roads within a 60-foot ROW. Drawing No. BH-E- 103 (Typical Underground Trench Alignment) depicts collection schematic drawings. The schematics for three and four circuits show a "1 0-foot Buffer Work Access". Based on the Department's observations of construction activities on the Applicant's Wethersfield Windpark, greater ROW widths will be required in locations. Specifically, additional work space (ROW widths) will be required for the temporary stockpiling of topsoil. A ten- foot width linear temporary workspace is not adequate for the temporary storage (stockpiling) of topsoil removed to a minimum 8-inch depth from a 50-foot ROW. Linear topsoil stockpiles shall be appropriately coordinated with the placement/installation of underground collector cables (including other potential underground utilities) installed adjacent to access roads. Wider ROW widths will eliminate the need to handle stockpiled topsoil more than once; thus reducing the potential for additional soil resource impacts including top-soil/sub-soil mixing and soil compaction.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017 and has, to the maximum extent practicable, limited impacts on agricultural land with micrositing practices. NYSDAM did not provide public comment on the 2016 SDEIS. In addition, Figure 1 in Section 1 of this FEIS presents the FEIS layout of the Project including all Project Facility locations.
DEIS-0002-6	Department of Agriculture and Markets	Section 1.2.2 discusses the installation of "ditch plugs" in wetlands for the purpose of preventing migration of shallow groundwater in linear excavations. Trench breakers are typically installed for the dual purpose of preventing trench washouts during construction and abating water piping and "blowouts" subsequent to trench backfilling. In this case, the installation of trench breakers in buried collector line trenches is critical due to the fact that the Project site is dominated by dense	Please see response to comment ID: DEIS-0002-5.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		glacial till and glacio-lacustrine soils. Penetration (excavation) will create a subsurface drainage envelope along the linear expanse of the trench unless such flows are alleviated or removed via miificial drainage from the trench. Thermal sand used as bedding will further exacerbate this condition. Because of this, the applicant should install trench breakers in agricultural fields in accordance with the spacing intervals as detailed on the Sample Drawing A-12 "Trench Breaker Spacing" (Attached). The Project Applicant shall also record each installed trench breaker location by map referenced station number. In agricultural lands, the top of trench breaker will not be closer than two feet from the restored surface. Additional subsurface drainage may be required following installation of buried electrical collector cables to effectively convey trench water to a stable surface outlet (see #26 below). Electrical collector cable runs will require close monitoring for evidence of seeps and waterboils during the 2-year monitoring period. Because of the proposed method of buried electrical collector cable installation (trenching), and the inherent difficulties associated with the installation of trench breakers during cable installation, the Department recommends that the Project Applicant closely monitor the toe of slope areas in agricultural fields for wet areas or signs of seeps and water boils in cases where trench water is exfiltrating to the ground surface. If encountered, new interceptor drain lines should be installed in order to alleviate wet areas. The Applicant should make necessary provisions for post-construction drainage repairs in agricultural fields. Because of potential limitations on slope, topography and other surface features, it may be necessary to install drainage structures and correspond-	

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		ing outlets in locations outside of the Applicant's "permitted" ROW. The Department recommends that the Applicant make necessary arrangements with the Town, other Permitting Agencies and with individual landowners to allow for flexibility to install drainage features outside of the "permitted" ROW. In some cases, drainage easements may be required for off-ROW outlets.	
DEIS-0002-10	Department of Agriculture and Markets	Where temporary access is necessary across agricultural portions of the transmission line ROW, topsoil shall be removed including the entire "A" horizon down to the beginning of the subsoil "B" horizon. All topsoil that is stripped shall be stockpiled and separated from other subsoil, woody debris and other excavated or construction materials. All topsoil must be stripped, stockpiled and uniformly returned (following subsoil decompaction and rock picking) to restore the original soil profile. Installation of matting shall be allowed as an alternative to topsoil stripping.	Please see response to comment ID: DEIS-0002-5.
DEIS-0002-14	Department of Agriculture and Markets	Section 2.4 discusses potential construction impacts on site soils. The section describes a 5- acre O&M facility for which a final location is unknown at this time. The DEIS states that the final location and impacts will be identified in the FEIS. Inclusion of this information in the FEIS does not allow the Department sufficient opportunity to thoroughly review the potential impacts to agricultural resources and provide additional comments (if necessary). As a result, the Department requests that potential locations be provided for review prior to the issuance of the FEIS.	Please see response to comment ID: DEIS-0002-5.
DEIS-0002-15	Department of Agriculture and Markets	Section 2.4 discusses potential construction impacts on site soils including rutting and compaction of agricultural soils. The Applicant identified soil types which are prone to rutting and compaction. The Applicant should	Please see response to comment ID: DEIS-0002-5.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		identify (graphically depict on Project drawings) these soil types so that construction practices can be adapted accordingly by construction crews in the field. These impacts can be avoided by stripping topsoil or matting the construction area where heavy equipment has the greatest potential to adversely impact agricultural soils. The Department recognizes that at times it may be necessary to account for landowner preference when determining the level of disturbance including topsoil stripping (Example: installation of a single circuit buried electrical collector cable or setting of a single transmission pole in an isolated field corner). However, based on the Department's experience, long-term impacts from soil mixing and compaction are far greater than the temporary disturbance associated with the normally accepted construction and restoration sequence on agricultural soils. Temporary impacts to crop production from topsoil protection measures pose a far less long-term viability impact to a farm operation than do impacts from soil mixing and compaction. Crop loss considerations with landowners should be utilized for losses in crop production associated with topsoil protection measures. Noble's Project Development staff and Agricultural Monitor(s) should take a proactive role in explaining to Project participants (landowners) the need and benefits of performing topsoil protection measures in agricultural fields. If there are areas of the project site whereby topsoil protection measures will not be implemented in agricultural fields, the Department requests that the Project Applicant or the Agricultural Monitor notify Department staff and identify those areas for field review prior to commencing construction or ROW clearing activities. The Department will review each identified location on a case-by-case basis, consult with the affected farm landowner or farm operator (if neces-	

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		sary) and a mutual determination will be made.	
DEIS-0002-16	Department of Agriculture and Markets	Section 2.4 also discusses rock picking following decompaction. This section describes the removal of rocks which are "introduced during grading or trenching". This section should be revised to reflect proper agricultural restoration sequencing by stating that rocks 4-inches in diameter and larger that are uplifted to the subsoil surface as a result of subsoil decompaction will be removed prior to the replacement of topsoil.	Please see response to comment ID: DEIS-0002-5.
DEIS-0002-17	Department of Agriculture and Markets	Table 2.4-1 indicates that 92.84 acres of the proposed facility areas may encounter soils having a shallow depth to bedrock. Has this information been identified relative to Project facilities, i.e., the identification of shallow soils at specific turbine foundation sites and buried electrical collector line routes? Will this information be made available to field personnel? If so, the Applicant should describe how this information will be effectively conveyed to field personnel during construction. On agricultural land, ripped or excavated bedrock, boulders and concentrations of excavated stone or rock materials should not be returned to the excavation or trenches any closer than 24-inches from the exposed (subsoil) work surface of the stripped portion of right-of-way. The remainder of the backfill should be limited to suitable subsoil material, backfilled up to the top of the exposed work surface. Excess waste rock/stone materials should be removed from active agricultural areas.	Please see response to comment ID: DEIS-0002-5.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-18	Department of Agriculture and Markets	Section 2.4.2 discusses project facility impacts. Specifically, .06% of soils in the Project Area will be permanently impacted at proposed turbine locations. Does this percentage take into account the proposed sixty 140-foot by 40-foot permanent gravel crane pads to be left in place and has a separate percentage been calculated and included for the proposed pad mounted junction terminals associated with buried electrical collector system tie-ins?	Please see response to comment ID: DEIS-0002-5.
DEIS-0002-19	Department of Agriculture and Markets	Section 2.4.2 describes the potential for permanent impacts associated with project -related facilities on agricultural lands and the total acreage of prime farmland and farmland of statewide importance that will be permanently impacted by the proposed Project through conversion to non-agricultural uses. The consultant for the Applicant states that the conversion of these agricultural soils is "minimal and will not significantly affect these soil resources in the Towns and county". While these acreages may appear to be minimal to the DEIS preparer, facilities such as permanent gravel crane pads, junction boxes, guying wires, permanent access roads and, in some instances, improperly designed and implemented stormwater practices can present significant adverse affects to the long-term viability of farm operations in the Project area. Construction of these facilities can create serious impediments to established field cropping systems, field access and drainage patterns. These potential impacts should be included in this section and discussed in more detail in the FEIS.	Please see response to comment ID: DEIS-0002-5.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-21	Department of Agriculture and Markets	Section 2.4.3 discusses mitigation activities. The section states that impacts to agricultural lands will be minimized by restricting project ·equipment and access to the approved construction ROW. The Department requests that the Project Applicant provide a more detailed description of the anticipated methods intended to restrict equipment access to non-approved (active agricultural) areas of the project site during construction.	Please see response to comment ID: DEIS-0002-5.
DEIS-0002-22	Department of Agriculture and Markets	Page 2-23 of the DEIS discusses restoration timing in agricultural fields. Any topsoil handling, soil restoration activities (specifically decompaction and topsoil replacement activities conducted after October 1 and prior to May 1) should be coordinated with the Department following favorable Atterberg soil test (soil plasticity) results.	Please see response to comment ID: DEIS-0002-5.
DEIS-0002-23	Department of Agriculture and Markets	Page 2-25 of the DEIS discusses impacts to topsoil and subsoil. A general discussion of restoration sequencing through agricultural lands is presented. The last paragraph states that soil decompaction will be conducted prior to topsoil replacement. This paragraph should be revised to include the removal of rocks 4-inches or greater following subsoil decompaction (prior to topsoil replacement).	Please see response to comment ID: DEIS-0002-5.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Safety			
DEIS-0001-3	Public Service Commission	The location of steel gas pipelines should be determined when planning the location of wind turbines and grounding systems, and electric collection and transmission lines. The DEIS identifies major gas transmission facilities, but does not identify the location of gas gathering lines. (See Fig. 2.23-3 -- Setbacks from Utilities.) Appropriate\ avoidance and mitigation measures to avoid induced voltages and lightning protection system grounding issues should be developed in project layout and detailed design. This is information that DPS requested in comments on the scope of studies appropriate for the project (as indicated at DEIS Appendix D, page D-87).	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0002-11	Department of Agriculture and Markets	At the end of construction on the transmission line, the ROW and respective work areas, including guying wire assembly and disassembly sites, shall be thoroughly cleared of construction debris such as nuts, bolts, spikes, wire, etc.	Please see response to comment ID: DEIS-0002-5.
DEIS-0004-10	Diana Robinson	This along with the noise and health affects will be a great detriment to us in the enjoyment or sale of our property considering the number and close proximity of proposed turbines.	Please see responses to comment IDs: DEIS-0004-08 through DEIS-0004-10.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-12	Diana Robinson	According to study done by Nina Pierpont· Wind Turbine Syndrome: Noise, Shadow Flicker, and Health (8-1-06). posted July 26th, 2008 in Articles by Nina Pierpont. She gives reference to the Ellenburg, Clinton, and Altona Wind Energy Facilities Ordinances which are questionably considered wind turbine "industry standards," and to the NYS DEC, and WHO (World Health Organization) who have differing standards. There may not be legal requirements on many factors related to wind turbines, but health and wellness consideration must take priority. Problems sited are: sleep problems, headaches, dizziness, nausea, exhaustion, anxiety, anger, and the list goes on. Chronic sleep problems being the number one concern.	Please see responses to comment IDs: DEIS-0004-08
DEIS-0004-13	Diana Robinson	The Academy of Medicine of France has recommended a minimum of 1.5km (. 96 mile) setback due to noise and health issues. All thirteen turbines listed above except T-20 are closer than the . 96 mile recommended. From the Lincoln Township, WI., Study on Shadow Flicker ... a setback of one mile was determined. Again as with the findings of The Academy of Medicine of France, approximately a one mile setback is needed for health related reasons	Please see responses to comment IDs: DEIS-0004-08
DEIS-0004-14	Diana Robinson	For Noble to offer action such as "adding curtains to the windows" as was suggested by a Noble employee would add insult to injury. The proposed configuration of wind turbines would subject us to shadow flicker during both sunrise and sunsets. The only realistic mitigation measure is setback distance for both noise and shadow flicker in avoiding all health concerns.	Please see responses to comment IDs: DEIS-0004-08

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-15	Diana Robinson	Additionally, it should be noted that T-4 is shown to be located within a 500 ft distance of a residence not shown on the master map and located on a property that is less than 50 acres. We were told by a Noble representative (Tim Marvich) that owners must have at least 50 acres to have a wind turbine. This is also the turbine of greatest concern to us being the closest for noise, causing the greatest degree of shadow flicker, and affecting our primary view.	Please see responses to comment IDs: DEIS-0004-08 through 2008DEIS-0004-10.
DEIS-0004-17	Diana Robinson	*Mitigation .. the only realistic mitigation for us is setback distance due to noise, shadow flicker, health, primary view affected along with domination of the general landscape 360 degrees seven days a week for many years to come. Our particular property) due to our location being at the highest elevation on Round Top Rd and the openness surrounding our residence, will be adversely affected whether we remain as residents or choose to sell. I know of no other property in the project that will be affected as greatly as ours. It should also be noted prevailing winds come from the west of our house with the closest of turbines T2, T3, and T 4 in line with the prevailing winds and our home.	There are zero residences within 1,200 feet of a turbine in the FEIS Layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0004-20	Diana Robinson	*Set back -distance for seasonal homes should be established due to health concerns, blade failure, ice on blades etc.	There are zero residences within 1,200 feet of a turbine in the FEIS layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0004-26	Diana Robinson	* Health and Wellness must remain #1 priority for town board and residents.	Thank you for your comment.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0005-1	Kathryn McGraw	We are off-site Bartlett Hill Road property/home owners who will be directly impacted by the Ball Hill wind turbines. Specifically, T45 will be located only 1075' from our house and less than 1000' from other portions of our property according to information found on Noble's website. Having researched wind turbines and their impacts on nearby residents and having visited the Bliss windpark, it is our informed opinion that a minimum setback of 1000' is very inadequate. Our property will be impacted visually and by the noise and flicker associated with 400' wind turbines sited so closely. We request that T45 be positioned further south so as to increase its distance from our house.	There are zero residences within 1,200 feet of a turbine in the FEIS Layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-8	JD Robinson	The next question is, the snowmobile trails. We have one that runs the perimeter of the back of our property, around the 50 acres that we own and comes out towards the front. I just wanted to know what the effect is here with the turbines, whether there is a setback distance to the trails or snowmobile riders. I know we talked at the last meeting, we mentioned about ice coming off the turbine blades and even a possibility of the failure. And these things run through the woods, I assume ii would be, you know, all season.	Mr. Spitzer responded directly to this comment during the October 30, 2008, public hearing and stated: "The law [wind law] does not have a setback requirement for the snowmobile trails." This FEIS presents the updated Project layout for town and public review. Ball Hill provided an updated Ice and Blade Throw Analysis in the Amended Application to the Town of Villenova in September 2016, which states that "Implementation of best practices safety procedures during operation of the wind farm can reduce the risk of ice throw, including, but not limited to: visual inspections, de-icing and anti-icing systems, regular and routine maintenance by full-time turbine technicians assigned to wind farm operations, curtailment of turbines in hazardous conditions, educating staff/landowners on specific weather conditions and associated throw risks, standard safety protocols where icing is imminent, and public safety warning signs near public areas and project boundaries." The buildup of ice on the blades impacts the ability of the turbine to function as designed. The weather conditions and decreased turbine performance will be observed in the SCADA center and the identified turbine or turbines will be adjusted to avoid or minimize both ice throw and damage to the turbine itself.
Water Quality and Wetlands			
DEIS-0001-5	Public Service Commission	Underground electric lines: Underground electric collection lines should be installed with provisions to avoid effects of subsurface "piping" of subsurface water creating and expanding voids around the electric cables running down steep slopes. Underground trench-breakers with surface water control features should be specified for underground lines installed on slopes.	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0001-8	Public Service Commission	Transmission line angle structure number 5 (Drawing BH-T301, Sheet 1) is proposed to be located within a NYS-regulated wetland (reference Appendix G, Wetlands Map Sector F). An alternative location for structure 5 to the south should be considered to avoid permanent impact to the wetland for location of the structure, as well as additional temporary impacts related to clearing for construction (including angle structure laydown and wire pulling at this location). (Note that this type of alignment appears to have been identified in an earlier project layout, as indicated in Appendix T, Figure 5.1.)	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-9	Public Service Commission	Transmission line angle structure 19 appears to be located at a stream. Structures should be set back from stream banks to accommodate streamflow, flooding, and the potential for bank movement due to streambank erosion, and to provide room for structure construction out of the stream.	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-10	Public Service Commission	The Transmission Line Plan and Profile figures (as well as wetland and stream location figures in Appendix G) do not indicate locations of access roads for construction of the transmission facilities. Streams, ravines, wetlands and other features appear to create impediments to continuous through-access along the transmission line right-of way. Access road locations, including off-right-of-way locations should be specified. Appropriate consideration of clearing, wetland fill, stream crossings, agricultural land practices, soils and slopes constraints, as well as erosion control and site stabilization measures for the access roads should be addressed within the EIS.	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0001-11	Public Service Commission	Construction of the transmission line will result in impacts due to forest clearing, access and construction in agricultural lands, wetlands and stream crossings, disturbance at steep slopes, drilling for pole placements, access road construction, and other activities related to line construction. Site plan and profile drawings for construction planning and construction impact minimization should be developed as mitigation measures appropriate for activities related to transmission line construction. The plan and profile drawings should show information including details such as: limits of clearing; property line locations and setbacks; access road details including temporary improvements for stream and wetlands crossing; transmission pole locations and work pad locations; streams and wetlands and appropriate protection measures; fences, drainage ditches and other improvements; other utility features, electric, gas, telecomm lines; roads and railroads to be crossed by the transmission line; construction controls and mitigation measures to avoid or minimize impacts on these and other features and resources located within the right-of-way and access road locations.	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0002-6	Department of Agriculture and Markets	Section 1.2.2 discusses the installation of "ditch plugs" in wetlands for the purpose of preventing migration of shallow groundwater in linear excavations. Trench breakers are typically installed for the dual purpose of preventing trench washouts during construction and abating water piping and "blowouts" subsequent to trench backfilling. In this case, the installation of trench breakers in buried collector line trenches is critical due to the fact that the Project site is dominated by dense glacial till and glacio-lacustrine soils. Penetration (excavation) will create a subsurface drainage envelope along the linear expanse of the trench unless such flows are alleviated or removed via miificial drainage from	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017 and has, to the maximum extent practicable, limited impacts on agricultural land with micrositing practices. NYSDAM did not provide public comment on the 2016 SDEIS. In addition, Figure 1 in Section 1 of this FEIS presents the FEIS layout of the Project including all Project Facility locations.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		the trench. Thermal sand used as bedding will further exacerbate this condition. Because of this, the applicant should install trench breakers in agricultural fields in accordance with the spacing intervals as detailed on the Sample Drawing A-12 "Trench Breaker Spacing" (Attached). The Project Applicant shall also record each installed trench breaker location by map referenced station number. In agricultural lands, the top of trench breaker will not be closer than two feet from the restored surface. Additional subsurface drainage may be required following installation of buried electrical collector cables to effectively convey trench water to a stable surface outlet (see #26 below). Electrical collector cable runs will require close monitoring for evidence of seeps and waterboils during the 2-year monitoring period. Because of the proposed method of buried electrical collector cable installation (trenching), and the inherent difficulties associated with the installation of trench breakers during cable installation, the Department recommends that the Project Applicant closely monitor the toe of slope areas in agricultural fields for wet areas or signs of seeps and waterboils in cases where trench water is exfiltrating to the ground surface. If encountered, new interceptor drain lines should be installed in order to alleviate wet areas. The Applicant should make necessary provisions for post-construction drainage repairs in agricultural fields. Because of potential limitations on slope, topography and other surface features, it may be necessary to install drainage structures and corresponding outlets in locations outside of the Applicant's "permitted" ROW. The Department recommends that the Applicant make necessary arrangements with the Town,	

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		other Permitting Agencies and with individual landowners to allow for flexibility to install drainage features outside of the "permitted" ROW. In some cases, drainage easements may be required for off-ROW outlets.	
DEIS-0002-12	Department of Agriculture and Markets	Page 1-17 of the DEIS discusses access road construction and the installation of culverts to "maintain a water table elevation below the base material to ensure roadbed stability". According to this Section, roadside ditches will be constructed as dictated by the terrain to convey stormwater runoff away from roadways. Culverts, fords, roadside ditches or other stormwater collection and conveyances should not be constructed so as to allow direct discharge into active agricultural fields. Culverts and other water conveyance devices should be designed and implemented to divert flows away from active agricultural areas into existing or new water conveyance systems (i.e., drainage ditches, grassed waterways, swales, diversion ditches or other appropriate water control structures).	Please see response to comment ID: DEIS-0002-6.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-19	Department of Agriculture and Markets	Section 2.4.2 describes the potential for permanent impacts associated with project -related facilities on agricultural lands and the total acreage of prime farmland and farmland of statewide importance that will be permanently impacted by the proposed Project through conversion to non-agricultural uses. The consultant for the Applicant states that the conversion of these agricultural soils is "minimal and will not significantly affect these soil resources in the Towns and county". While these acreages may appear to be minimal to the DEIS preparer, facilities such as permanent gravel crane pads, junction boxes, guying wires, permanent access roads and, in some instances, improperly designed and implemented stormwater practices can present significant adverse affects to the long-term viability of farm operations in the Project area. Construction of these facilities can create serious impediments to established field cropping systems, field access and drainage patterns. These potential impacts should be included in this section and discussed in more detail in the FEIS.	Please see response to comment ID: DEIS-0002-6.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-24	Department of Agriculture and Markets	Page 2-26 of the DEIS identifies potential drainage impacts and the proposed methods to address those impacts. This Section states that the Applicant will mitigate potential impacts by implementing subsurface interceptor drain lines, ditch plugs, culverts and fords crossings to maintain natural drainage patterns. Culverts and fords should be designed and constructed with suitable outlets. Stormwater collected from impervious surfaces of the project facilities or hydrologically active areas located up-slope from project facilities should not be directed into active agricultural fields without some form of velocity and volume attenuation, i.e.,. flow dissipation, surface inlet, discharge to existing drainage feature, etc. If existing runoff issues are encountered and hydrologically active areas are identified in areas located up-slope from proposed project facilities, they should either be addressed on a case-by-case basis in storm water management practice designs, or project facility (roads, turbine sites, etc) locations should be modified to avoid identified hydrologically active areas. The applicant should address up-gradient stormwater flows which "run-on" to Project facilities as well as runoff issues in, and adjacent to agricultural areas of the Project. The Department requests a copy of the Stormwater Pollution Prevention Plan in order to review the permanent post construction Stormwater Management Practices (SMPs) proposed for the Project and assess their compatibility with each farm operation's long-term operational viability.	Please see response to comment ID: DEIS-0002-6.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-26	Department of Agriculture and Markets	In Section 2.4.3, subsurface drainage is discussed. The Section states that "New subsurface drain lines will meet or exceed the condition of existing installed structures ... " In accordance with Department Guidelines, new subsurface drain lines shall be AASHTO M252 single wall drain line or equivalent and shall be installed in accordance with the applicable USDA Natural Resources Conservation Service (NRCS) Conservation Practice Standard for "Subsurface Drain" (608). F405 may not be used in agricultural lands for this drain tile application. Tile outlets shall be constructed of Schedule 80 PVC and steel animal guards should be installed far enough in the pipe to allow it to swivel up and let debris pass without exposing the animal guard beyond the pipe outlet. A "splash rock" should be installed beneath the pipe outlet to dissipate the erosive forces of the discharge water from the drain tile and to prevent additional scouring from occurring beneath the outlet. Installation of substandard materials may warrant the removal and replacement with the required materials identified above. Department field staff should be notified when existing subsurface drain lines are first encountered during construction and also be notified in advance to witness drain tile repair activities.	Please see response to comment ID: DEIS-0002-6.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-13	New York State Department of Environmental Conservation	**Stormwater Pollution Prevention Plan** A detailed construction plan needs to be developed to incorporate stringent containment of construction materials, particularly concrete slurry. This would include such practices as the use of watertight forms, silt/stormwater fencing, controlled concrete truck washout areas, and covered storage of equipment and construction chemicals. Engineering specifications to describe these proposed practices need to be detailed in this plan. Additional impacts may result from spills of petroleum and other chemicals during construction and operation of the project. The Stormwater Pollution Prevention Plan (SWPPP) should prevent or minimize spill incidents and maximize control and cleanup of any of these incidents.	The updated Project and potential impacts were outlined in the SDEIS, which NYSDEC reviewed and commented on. The updated Project has considered these and the direct response to NYSDEC's comment on the SDEIS is in Table 2.4-1. With respect to the stormwater pollution prevention plan, please see response to comment ID SDEIS-0003-40.
DEIS-0003-14	New York State Department of Environmental Conservation	**Surface Water.** The following guidance pertains to work involving the crossing of water bodies and work in close proximity to regulated streams. 1. If work occurs within 50' of the top of a bank of a DEC classified C(t) or C(ts) stream, erosion control planning will be necessary. This should be part of the storm water management plan for the site. 2. All underground lines shall be done in the dry 3. All work is prohibited in a protected trout stream from 10/15 through 5/31. 4. Siltation prevention measures shall be installed and maintained during the project to prevent movement of silt and turbid waters from the project site and into any watercourse, stream, water body or wetland. 5. Before trenching through stream banks, upland sections of the trench shall be backfilled or plugged to prevent drainage of possible trench water into the stream.	The updated Project and potential impacts were outlined in the SDEIS, which NYSDEC submitted public comment on. The updated Project has considered these and the direct response to NYSDEC's comment on the SDEIS is in Table 2.4-1. With respect to the crossing of waterbodies, please see response to comment ID SDEIS-0003-4.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		6. Underground collection lines and culvert installations shall be done in one operation without any delay between construction phases. Care must be taken to design and build culverts correctly – particularly when it involves crossing a navigable water body or a state regulated stream. Please see our website for an overview on proper culvert design: http://www.dec.ny.gov/permits/49060.html. The particular details of culvert design must be worked out in consultation with the DEC and must address concerns such as 25 year flood event design, maintaining channel geometry, proper use of rip rap, cofferdam specifications, work in the dry, culvert slope, etc.	

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-15	New York State Department of Environmental Conservation	**Wetlands. General Issues.** Projects that propose to disturb regulated wetland areas, buffer areas and protected streams require permits from DEC and the U.S. Army Corps of Engineers (USACE), DEC wetland permit regulations at 6 NYCRR 663.2(z) define a "regulated activity" as any form of draining, dredging, excavation, or mining, either directly or indirectly, any form of dumping or filling, either directly or indirectly; erecting any structures, constructing roads, driving pilings, or placing any other obstructions whether or not changing the ebb and flow of the water; any form of pollution, including but not limited to installing a septic tank, running a sewer outfall, discharging sewage treatment effluent or other liquefied wastes into or so as to drain into a wetland; or any other activity which substantially impairs any of the several functions or benefits of wetlands which are set forth in section 24-0105 of the (Freshwater Wetlands) Act. These activities are subject to regulation whether or not they occur upon the wetland itself, if they impinge upon or otherwise substantially affects the wetland and are located within the adjacent area.	The updated Project and potential impacts were outlined in the SDEIS, which the NYSDEC submitted public comment on. The updated Project has considered these and the direct response to NYSDEC's comment on the SDEIS is in Table 2.4-1 including detailed comments on the wetland delineations and impacts.
DEIS-0003-16	New York State Department of Environmental Conservation	Before DEC can consider a permit application, wetland delineations prepared for the project must be verified by agency staff, DEC jurisdiction and resulting acreage impacts may vary based on DEC verification of wetland delineations. It is DEC policy that wetland impacts are not permitted, even with mitigation, until all other alternatives have been explored, including avoidance, minimization or reduction of impacts. Generally applicants are required to 1) Examine alternative project designs that avoid and reduce impacts to wetlands; 2) Develop plans to create or improve wetlands or wetland functions to compensate for unavoidable impacts to wetlands.	Please see response to comment ID 0003-15.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-17	New York State Department of Environmental Conservation	The DEC guidance document, *Freshwater Wetlands Regulation guidelines on Compensatory Mitigation*, October 26, 1993, states that "Temporary disturbances, where preconstruction conditions are essentially restored, for example when laying a pipeline, do not require compensatory mitigation since there is no permanent loss. However, impacts to the wetland must first be avoided and then minimized as with any other project, and efforts to reduce disturbances during construction, such as erosion control, will still be required. "USACE defines "permanent" impacts as the loss of waters of the United States, and includes the area where fill is placed plus areas that are adversely affected by flooding, excavation or drainage as a result of a project. Where the project area is restored to pre-construction contours and elevation, it is not included in the calculation of permanent loss of waters (permanent impacts). This includes temporary construction mats (e.g. timber, steel, geotextile) used during construction activities and removed upon the completion of the work. However, where certain functions and values of waters of the United States are permanently adversely affected (such as the conversion of a forested wetland to an herbaceous one in a permanently maintained utility right-of-way), USACE requires mitigation to reduce the adverse effects of the project to the minimal level. The wetland analysis in the FEIS should be refined to apply the full range of potential impact criteria to the proposed construction activity in the determination of total area of permanent impact; not just those areas proposed for permanent placement of fill. This is necessary to quantify the total affected area for permitting and requirements for mitigation.	Please see response to comment ID 0003-15.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-18	New York State Department of Environmental Conservation	Simple re-grading to pre-construction contours following excavation in a wetland area may not be enough to restore the full function of the existing wetland area. Any clearing or grading that disturbs wetland soils can result in permanent impacts to wetland area. Any clearing or grading that disturbs wetland soils can result in permanent impacts to wetlands. Grading a wetland or adjacent area can substantially alter surface water drainage and flow patterns, may temporarily increase erosion, and may eliminate fish and wildlife habitat. Clear-cutting removes the vegetative cover of wetlands and may reduce their ability to absorb water and serve as habitat, and can also cause soil erosion. Dredging or excavation may increase water depth and remove wetland vegetation, thus altering the basic characteristics of, and perhaps destroying, wetlands. Fish and wildlife feeding or reproductive capacities may be altered, as may cover types, turbidity, sediment deposition, and erosion patterns. Any of these activities can cause the permanent loss of benefits provided by wetlands and may, in fact, de4stroy wetlands entirely.	Please see response to comment ID 0003-15.
DEIS-0003-19	New York State Department of Environmental Conservation	**Specific concerns.** The following comments are based on staff review and focus on freshwater wetlands impacts described in Nobel's DEIS for the Ball Hill Windpark. In the first paragraph of Section 2.8 (page 2-61), Nobel stated that the project facilities have been sited to minimize or avoid wetland impacts to the greatest extent practicable. DEC staff generally concurs with Nobel's statement for the generation component of the project. The turbine pads and access roads have been sited outside current mapped freshwater wetlands and adjacent areas. Construction of the generation component of the project will not result in any permanent disturbance to State-regulated wetlands.	Please see response to comment ID 0003-15.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-20	New York State Department of Environmental Conservation	Based on a site visit on September 8, 2008, no currently unmapped wetlands are in the project area. Hence, State-regulated, freshwater wetlands in the project area appear to be limited to the two cited in the DEIS. The DEC determined, based on the site visit, that Wetlands W59 and W60 are separated from Wetland SC-13 by more than 50 meters and therefore are not state jurisdictional wetlands due to their small size. The DEC modified the delineations of W61 and W65 (Freshwater Wetland SC-13), and W111 (Freshwater Wetland SC-12) during their site visit (which are along the transmission line corridor). These findings and others were outlined and submitted to Mr... Andrew Francisco of Ecology and Environment, Inc. in a letter dated October 10, 2008. Those changes as outlined in this paragraph and this letter must be incorporated into the FEIS.	Please see response to comment ID 0003-15.
DEIS-0003-21	New York State Department of Environmental Conservation	Wetland W104 is not state jurisdictional. The narrow linear portion that connects the northern and southern portions does not meet state wetland criteria. Without that connection, neither the northern or southern wetland is close to 12.4 acres in size. This wetland is along the transmission line corridor as opposed to the generation portion of the project.	Please see response to comment ID 0003-15.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-22	New York State Department of Environmental Conservation	Appendix H of the DEIS describes the preliminary wetland mitigation plan. The DEC generally concurs with Nobel's mitigation goals and objectives. However, the DEC would like to clarify that the mitigation area (still to be selected by Noble) must be contiguous with a state jurisdictional wetland and not just hydrologically connected (as stated in Section 2.2 of Appendix H). The proposed wetland mitigation must be the restoration or creation of wetland with the functions and values lost by the impacts. Preservation of existing wetlands through conservation easements, while beneficial, would not qualify as mitigation for impacts to State-regulated wetlands. Mitigation for impacts to adjacent area must be discussed in the FEIS.	Please see response to comment ID 0003-15.
DEIS-0003-23	New York State Department of Environmental Conservation	The DEIS does not specifically describe the proposed measures to remediate temporary impacts to freshwater wetlands and adjacent areas. This should be corrected in the FEIS. All disturbed areas must be returned to original grade with an adequate depth of topsoil to support plant growth. All disturbed areas must be seeded with an appropriate native seed mix and mulched (or hydroseeded) to prevent erosion and sedimentation.	Please see response to comment ID 0003-15.
DEIS-0003-24	New York State Department of Environmental Conservation	The Invasive Species Management Plan (ISMP) in Appendix K addresses the identification, management, and monitoring of invasive species within the project area. While the strategies outlined in this plan are sound, management practices, particularly herbicide application, must be conducted at the appropriate time of year and according to NYSDEC recommendations or permit requirements specific to this site. While management should begin immediately upon disturbance or discovery of infestations, further management may be required beyond the initial period.	Please see response to comment ID 0003-15.

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Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-25	New York State Department of Environmental Conservation	The ISMP presents detailed information on the restoration and monitoring of State-regulated wetland and adjacent area, including seed mixtures to be used. This kind of information is lacking throughout the other sections of the DEIS that discuss impacts to regulated areas and should be included in the FEIS.	The updated Project and potential impacts were outlined in the SDEIS, which the NYSDEC submitted public comment on. The updated Project has considered these and the direct response to NYSDEC's comment on the SDEIS is in Table 2.4-1, including detailed comments on the ISMP.
DEIS-0003-26	New York State Department of Environmental Conservation	Calculation and discussion of impacts to the State regulated 100-foot adjacent area is generally lacking in the DEIS. These impacts should be discussed in the impact and mitigation sections and included in the appropriate Tables.	Please see response to comment ID 0003-15.
Sound			
DEIS-0001-2	Public Service Commission	Step-up transformers may be a source of operating noise, which should be addressed in the DEIS. Noise level and potential pure tone generation should be modeled for the specific make and model transformers proposed at both the Substation and the Switchyard sites. Nearby noise receptors should be identified, including any residences, and expected noise effects and appropriate mitigation measures should be identified for minimizing noise impacts.	The updated Project facilities were outlined in the SDEIS, which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1. As detailed in Appendix J, Sound Level Assessment Report, sound produced by the wind turbines and substation may be audible at times, but would be far from "deafening," and within the sound level limits approved by the Town of Villenova and Town of Hanover. For more details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.
DEIS-0004-7	Diana Robinson	Noise will affect us daily, Construction and repairs will add disruption to our lives.	As detailed in Appendix J, Sound Level Assessment Report, sound produced by the wind turbines may be audible at times, but would be far from "deafening," and within the sound level limits approved by the Town of Villenova. For more details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-10	Diana Robinson	This along with the noise and health affects will be a great detriment to us in the enjoyment or sale of our property considering the number and close proximity of proposed turbines.	Please see responses to comment IDs: DEIS-0004-08 through DEIS-0004-10.
DEIS-0004-11	Diana Robinson	These thirteen wind turbines, would an be in our line of sight; adding noise, dominating the view whichever way we look. Twelve of these thirteen wind turbines would be close enough to have a multiple audible affect The closest would be just over 1000 ft. Many more would only be 1500 to 4000 ft. distance.	Please see responses to comment IDs: DEIS-0004-08 through DEIS-0004-10.
DEIS-0004-14	Diana Robinson	For Noble to offer action such as "adding curtains to the windows" as was suggested by a Noble employee would add insult to injury. The proposed configuration of wind turbines would subject us to shadow flicker during both sunrise and sunsets. The only realistic mitigation measure is setback distance for both noise and shadow flicker in avoiding all health concerns.	Please see responses to comment IDs: DEIS-0004-08
DEIS-0004-15	Diana Robinson	Additionally, it should be noted that T-4 is shown to be located within a 500 ft distance of a residence not shown on the master map and located on a property that is less than 50 acres. We were told by a Noble representative (Tim Marvich) that owners must have at least 50 acres to have a wind turbine. This is also the turbine of greatest concern to us being the closest for noise, causing the greatest degree of shadow flicker, and affecting our primary view.	Please see responses to comment IDs: DEIS-0004-08 through DEIS-0004-10.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0004-17	Diana Robinson	*Mitigation .. the only realistic mitigation for us is set-back distance due to noise, shadow flicker, health, primary view affected along with domination of the general landscape 360 degrees seven days a week for many years to come. Our particular property) due to our location being at the highest elevation on Round Top Rd and the openness surrounding our residence, will be adversely affected whether we remain as residents or choose to sell. I know of no other property in the project that will be affected as greatly as ours. It should also be noted prevailing winds come from the west of our house with the closest of turbines T2, T3, and T 4 in line with the prevailing winds and our home.	There are zero residences within 1,200 feet of a turbine in the FEIS layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0005-1	Kathryn McGraw	We are off-site Bartlett Hill Road property/home owners who will be directly impacted by the Ball Hill wind turbines. Specifically, T45 will be located only 1075' from our house and less than 1000' from other portions of our property according to information found on Noble's website. Having researched wind turbines and their impacts on nearby residents and having visited the Bliss windpark, it is our informed opinion that a minimum setback of 1000' is very inadequate. Our property will be impacted visually and by the noise and flicker associated with 400' wind turbines sited so closely. We request that T45 be positioned further south so as to increase its distance from our house.	There are zero residences within 1,200 feet of a turbine in the FEIS layout. Figure 1 in Section 1 of the FEIS identifies the location of the Project facilities.
DEIS-0006-14	Dana Bennett	I don't know what it's going to do as far as sounds. I'm a truck driver. I need my sleep. If it's going to keep me up at night, there's going to be some serious problems.	As detailed in Appendix J, Sound Level Assessment Report, sound produced by the wind turbines may be audible at times, but would be far from “deafening,” and within the sound level limits approved by the Town of Villenova. For more details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-27	Nadine McCarthy	It was just the -- about the noise and people don't like what they look like. The generators. I just -- I had a lot of questions and what the revenue was going to be from them. And actually the first fellow that I talked to, I got different answers from him than the second person that came around. And the second person when I told him, what about ~- well, you're way lower than the first guy. He shook his head and said, well, we don't have those kind of turbines up there. Those are bigger ones that are going to generate that kind of revenue. So it was like, I'm thinking, you guys are not on the up and up. You seem like you are kind of scamish or something and you are already out of the Fredonia office, so from -- And then when we make phone calls, you don't get return calls. And you hear the beep on the answering machine that they must have several. And then the response is, when you do get a call back, well, I'm busy going around on other projects. I don't like as a business how they deal with people and the landowners. And, again, there's specific landowners that have to deal with this and J think they should be compensated somehow. And whoever said the fair - the good neighbor agreement or something just because you're being inconvenienced. And not to be compensated, l think is wrong. And the people who are pushing for it, don't see that. Their properties are not affected by it other than the fact they might get a tax break or something, but they are not dealing with these things right in their back door.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties project facilities will be constructed, as well as Host Community Agreements with the Town Boards of Villenova and Hanover. Each Town Board will be responsible for determining how the funds received will be used to benefit their respective towns. As detailed in Appendix J, Sound Level Assessment Report, sound produced by the wind turbines may be audible at times, but would be far from "deafening," and within the sound level limits approved by the Town of Villenova. For more details on the Sound Level Assessment for the Project, see Appendix J, Sound Level Assessment Report.
Public Participation			
DEIS-0006-1	Diana Ermer	My question is, how many people who are Board members are going to have the wind turbines on their property?	One board member in the Town of Villenova is a participating landowner in the FEIS layout of the Project. This board member has abstained from the board's decisions on this Project.

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Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-12	Dana Bennett	I believe this project has been going on for what? Three years, right? Okay. Well, I just found out about it a few months ago and I am still running across people that have no idea. I do not feel the notification of this project is realistic. It's ridiculous. Everybody has a right to an opinion, but you need the information to for that opinion. And this is a major project. It's going to affect everybody here and it's going to affect everybody for the rest of their lives here. It's just like I said, I feel any notification that has been made here is inadequate and needs to be readdressed. That counts for both towns, Town of Hanover and Town of Villenova.	Prior to the March 2, 2016, public hearing in the Town of Villenova on the SDEIS, Ball Hill prepared a notice of public hearing (which also advised that written comments would be accepted by the Lead Agency up to and including March 14, 2016) that was published in the *Dunkirk Observer* as required under the Villenova Wind Law, and in the Environmental Notice Bulletin as required under SEQRA. Ball Hill also mailed notices of the Public Hearing to residents within the distance specified under the Villenova Wind Law. Ball Hill appreciates that not all residents of Villenova or other parties interested in the Project may have received such notices, however, Ball Hill respectfully submits that it was not required or requested to provide Town-wide notice nor notice to residents outside Villenova. Ball Hill held an additional public hearing in the Town of Villenova on October 13, 2016, and in the Town of Hanover on November 9, 2016, in accordance with each Town's wind law. The notices for these public hearings are published in each Town's official newspaper and mailed on behalf of each Town Board to all property owners within the proposed Wind Energy Overlay District, defined as being within a 500-foot buffer around the portion of the Project Area in the Town of Villenova and within a 1,500-foot buffer around the portion of the Project Area in the Town of Hanover, as specified by the corresponding Town Wind Law. The Notice for these hearings will specify the Project, its amended application, and requests for the adoption of a local law for the creation of a Wind Overlay District and a local law amending the provisions of the towns' wind laws to increase the maximum height restrictions to 495 feet. Copies of the public notices are included in this FEIS in Appendix T.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-23	Dana Bennett	I think the last thing that's on my list that I wanted to ask now is, what -- get an explanation of what are good neighbor agreements, stuff like that. Who gets them? Why? I have heard nothing from the wind company at all. And like I said, I'm a hair of over half a mile from them and I've got neighbors that are pretty close and they have heard nothing either.	Ball Hill is responsible for negotiating lease agreements with property owners on whose properties Project facilities will be constructed.
DEIS-0006-26	Nadine McCarthy	My name is Nadine McCarthy and I live in Forestville, but I also own property on Round Top. So I agree with this gentleman with the lack of notification to landowners;. I also agree with his concerns for the visual impact because I too brought - bought the property because I loved the view and just the nature up there. And I rode to Bliss. And I didn't like how it looked and it was very upsetting 10 me. And some of my concerns too are more directed towards Noble which I don't have to get into tonight, but when I did address some of my concerns and ask questions, well, the response was always, go to Bliss or Arcade. I'm thinking, well, take me there or something. You know, don't just throw that out. That's not the way -- you don't deal with people that way, if you're on the up. I don't know. For a business, I thought that was kind of a poor approach or response. If the community benefits, that's a great thing. But yet, again, my concern was that this wasn't my intention for the property to look at what I'm going to have to be looking at and dealing with. So it's a disappointment to me that way and I hope down the line if I have to sell the property, I can sell it and benefit from the sale, but right now I am very disappointed. And I was hoping to retire up there and enjoy it. But at this point in time I don't think that was going to happen. I don't have anything else to say, but I just wanted to agree with him.	Please see response to comment ID DEIS-0006-12 for details on the public participation effort for the 2016 SDEIS. Copies of the public notices are included in this FEIS in Appendix T, Public Participation. The updated Project layout is described in this FEIS including updated visual impacts and shadow flicker estimates. For more details on the visual and shadow flicker impacts on the FEIS Project layout, see Appendix I, Visual Resource Assessment, of this FEIS. In addition, an assessment of the potential effects of the Project on property values from a wind project is presented in this FEIS in Appendix Q, Property Valuation Study. Based on analysis of sales data within an approximate 5-square-mile area surrounding four existing wind farms located throughout New York State, the study finds no conclusive evidence which would indicate any impact or potential impact on residential real estate values in the market area analyzed due to being in proximity or in the view shed of an operational wind farm. The study indicates that this conclusion is in concert with much of the quantitative research available today on wind farm development effects on property value. The study notes that while it is impossible to definitively say that there will be no effect on any property's value, it is apparent from studying similar areas where wind

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
			farms have been developed that no broad based value effects have occurred in those markets. Please refer to Appendix Q for additional information.
DEIS-0006-30	William Eaton	I would tend to agree with you on your notifications. I don't know how it occurrc-0. l don't live in the Town of Villenova and I don't buy the Observer paper, which I came by today. But as a landowner and part of the Project, I don't know how you would get information short of -	Please see response to comment ID DEIS-0006-12 for details on the public participation effort for the 2016 SDEIS. Copies of the public notices are included in this FEIS in Appendix T.
DEIS-0006-31	Dana Bennett	I think something of this magnitude really. I mean, a town-wide mailing I think is what should have been done. Yes, it's a cost. But like l said, everybody has an opinion, but they have to be informed before they can make that opinion. And like I said, I don't feel that the notification, and even though it's legal, I don't feel it's sufficient. Like I said, this is a massive project. It's going to affect everybody.	Please see response to comment ID DEIS-0006-12 for details on the public participation effort for the 2016 SDEIS. Copies of the public notices are included in this FEIS in Appendix T.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Biological Resources			
DEIS-0001-11	Public Service Commission	Construction of the transmission line will result in impacts due to forest clearing, access and construction in agricultural lands, wetlands and stream crossings, disturbance at steep slopes, drilling for pole placements, access road construction, and other activities related to line construction. Site plan and profile drawings for construction planning and construction impact minimization should be developed as mitigation measures appropriate for activities related to transmission line construction. The plan and profile drawings should show information including details such as: limits of clearing; property line locations and setbacks; access road details including temporary improvements for stream and wetlands crossing; transmission pole locations and work pad locations; streams and wetlands and appropriate protection measures; fences, drainage ditches and other improvements; other utility features, electric, gas, telecomm lines; roads and railroads to be crossed by the transmission line; construction controls and mitigation measures to avoid or minimize impacts on these and other features and resources located within the right-of-way and access road locations.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0001-12	Public Service Commission	The discussion of impact mitigation addresses lighting at switchyard and substation sites, and recommends "down firing, motion triggered, and task oriented" lighting at these facilities. DPS recommends revision of this proposal and that more specific mitigation requirements be implemented. Lighting should be task oriented, including lighting areas that are appropriate for access, and maintenance as needed. Task lighting should be controlled by manual switches to allow workers to light areas appropriate as needed to accomplish tasks. Motion triggered lighting can be inappropriately triggered by wildlife, blowing trash or vegetation, and is not recommended. Any lighting that will be regularly used should use full-cutoff fixtures and should be designed to avoid off-site lighting and glare. Fixtures should be specified as full-cutoff with no drop-down optics, which tend to spread light horizontally.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0002-13	Department of Agriculture and Markets	Section 1.2.2 of the DEIS states that the Project Sponsor will retain the services of an environmental monitor to ensure compliance with applicable permit conditions and other requirements. Due to the significant area of disturbance and agricultural mitigation/restoration activities required as part of this proposed Project, the Department recommends that the Applicant hire an experienced "Agricultural Inspector". Competent agro-environmental inspection and supervision of site preparation, construction and restoration activities is fundamental in helping ensure sound implementation and restoration techniques on agricultural lands. Such "Ag" - specific inspection/supervision is critical to a commercial wind energy project due to its concentrations of localized activity, extending over the expanse of the numerous tower sites, access roads and buried cable runs. To preserve objectivity during compliance inspections, the Department recommends the Project Sponsor provide funding for the Lead Agency to hire the Agricultural Monitor.	Please see response to comment ID: DEIS-0002-6.
DEIS-0002-20	Department of Agriculture and Markets	Section 2.4.3 discusses a post-construction monitoring plan to ensure that NYSDAM Guidelines are met. This post construction monitoring plan should be submitted to the Department for review and comment prior to the Town's issuance of the FEIS.	Please see response to comment ID: DEIS-0002-6.
DEIS-0006-9	JD Robinson	Has there been any studies done on the effect of·- well, I know possibly on some animals or birds by you, but has there been any studies done on the effect on horses? We have horses and my wife is concerned, so I have to ask.	Mr. Dan Spitzer and Ms. Kristin McCarthy responded directly to this comment during the October 30, 2008, public hearing and stated in summary, that other Noble wind farms in the area have not heard complaints of the impact of the farm on horses. The commenter was going to follow up with a fellow horse farmer he knew in the area to ask how the horses responded.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
Decommissioning			
DEIS-0001-16	Public Service Commission	The Decommissioning Plan does not appear to include costs to remove facilities and rehabilitate the site of the proposed transmission line and switch yard facilities.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-17	Public Service Commission	The Decommissioning Plan includes an estimate for removal of substation facilities; however, the estimate does not include any cost for a crane or crane operator. Substation removal should include crane costs for removal of large overhead components.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0006-3	JD Robinson	We were concerned, my wife and I were both concerned about the amount of bond that would be put up to remove these turbines. And I've spoken with an attorney that has been more recently involved in these things with other companies and he was indicating something like 20,000 per turbine. I don't know what our figure is here. But he said generally what they are offering is not anywhere near what would realistically be required to take them down at a later date.	Mr. Dan Spitzer responded directly to this comment during the October 30, 2008, public hearing with respect to the proposed Decommissioning Plan. An updated Decommissioning Plan for the Project is included in the FEIS as Appendix R.
DEIS-0006-4	JD Robinson	In lieu of the economy and the things that are happening now with the banks going out of business, you know, the financing just in turmoil, is this project something the financing has already been secured? Could it have - have we looked at the possibility that it may just change all of a sudden over the next year when they just start building? Is that money actually going to be there for the duration to complete the project? I was wondering how secure it was that they would have the financing or if they could even offer that at this point. Do they have a backup plan is maybe what I should be asking.	Noble is no longer the developer on this Project. Ball Hill intends to begin construction on the Project in 2017.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0006-7	JD Robinson	Do we have a way of plans of transitioning from one company to another should Noble go into bankruptcy or they just want to sell out to another company where the things that have been planned out carry across to the next company?	Mr. Spitzer responded directly to this comment during the October 30, 2008, public hearing and stated: "The law that was passed by this town requires that they get approval for any transfers of the company and the basic requirement is that the new company assume the obligations of the old. For the decommissioning for the security. It's up to them to propose something. Usually it's a bond, but it could be a letter of credit." The updated Project Decommissioning Plan is included in the FEIS as Appendix R.
Communication Surveys			
DEIS-0001-14	Public Service Commission	The analysis of communication signal interference was not based on location of proposed turbines or transmission facilities. While the project study area is generally located, the study area identified on figures in Appendix M does not include the area or location of the proposed 115 kV electric transmission line.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
DEIS-0001-15	Public Service Commission	Additional analysis of potential interference should be provided, based on detailed locations of wind turbines and transmission lines, including elevation and height of structures proposed.	The updated Project facilities were outlined in the SDEIS which the NYSPSC submitted public comment on. The updated Project layout has included these comments and the NYSPSC comment on the SDEIS is responded to directly in Table 2.4-1.
Bird and Bat Resources			
DEIS-0003-1	New York State Department of Environmental Conservation	**Executive Summary Page 4: Potential Projects Impacts and Mitigation-Birds and Bats.** This section states that, "if construction takes place in suitable nesting habitat for endangered or threatened species…during the breeding season, the work area will be surveyed by an environmental monitor in advance of construction." Should any listed species be found in the area, DEC Staff request construction is held in abeyance until the completion of the breeding season. Avoiding construction activities during this time will reduce the impact to sensitive species in the immediate vicinity of a given turbine, transmission line, or substation. More-	The updated Project and potential impacts were outlined in the SDEIS, which NYSDEC submitted public comment on. The updated Project has considered these and the NYSDEC comment on the SDEIS is responded to directly in Table 2.4-1. Since the DEIS many bird and bat surveys were conducted within the Project Area. Ball Hill participated in multiple meetings with NYSDEC and USFWS since the DEIS and SDEIS were issued. These meetings included discussion of avian and bat issues, in addition to other topics, and

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
		over, if any listed species are found nesting in the vicinity of the project, an Article 11 permit may be needed – even if work takes place after the breeding season has ended. Disturbing or destroying an endangered/threatened species habitat is considered a taking.	continued the long history of agency coordination dating back to the earliest years for this proposed Project. In an effort to reduce the impacts of wind energy projects on bird and bat resources, the USFWS recommends that wind energy project proponents develop a Bird and Bat Conservation Strategy (BBCS) that outlines the project development process and includes monitoring and conservation measures that would be implemented to avoid and minimize impacts on birds and bats at each project they propose to develop. In addition, Ball Hill is developing an Eagle Management Plan (Eagle MP) for the Project. The Eagle MP documents Bald Eagle and Golden Eagle use of the Project, describes efforts made to reduce risk due to Project development, documents communications and cooperation with the USFWS and NYSDEC, and the proposed post-construction monitoring and adaptive management approach for the Project.
DEIS-0003-2	New York State Department of Environmental Conservation	**Section 2.12.4.2: Mitigation-Lighting and Structural Mitigation.** For any lighting that may be needed at structures on site, it is recommended to block or shade the light (when doing so does not violate FAA specifications), so as to make it less noticeable to birds and bats passing overhead. This will reduce the likelihood animals will be attracted to an area with increased collision potential.	Please see response to comment ID DEIS-0003-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-3	New York State Department of Environmental Conservation	**Appendix J: Bird and Bat Risk Assessment. Summary of Findings.** The pre-construction studies performed and the information contained in the DFWMR "Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects" (see http://www.dec.ny.gov/energy/40966.html) Noble discussed their study plans with the DEC prior to initiating their work consistent with our recommendations.	Please see response to comment ID DEIS-0003-1.
DEIS-0003-4	New York State Department of Environmental Conservation	With respect to the marine radar studies conducted in the Fall of 2006 and the Spring of 2007, the DEC compared the mean passage rates, mean flight altitudes and percent of targets at altitudes less the 410 feet at the Ball Hill Windpark with the results from studies conducted at other wind energy facilities in western New York. The following observations concern the Fall 2006 radar study. Fall passage rates were lower than that reported in approximately 90% of the studies conducted elsewhere in western New York. The low passage rates were consistent with those reported from the study conducted at the New Grange Windpark (also undergoing review) that is located within only one mile of the Ball Park Windpark.	Please see response to comment ID DEIS-0003-1.
DEIS-0003-5	New York State Department of Environmental Conservation	**Fall radar study:** Fall mean flight altitude was lower than that reported in approximately 90% of the studies conducted elsewhere in western New York. However, only 9% of targets were recorded at altitudes less than 394 feet.	Please see response to comment ID DEIS-0003-1.
DEIS-0003-6	New York State Department of Environmental Conservation	**Fall radar study:** Compared to other sites having similar mean flight altitudes, this site has the lowest measured percentage of birds passing below the height of the turbine's windswept zone.	Please see response to comment ID DEIS-0003-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-7	New York State Department of Environmental Conservation	The following observations concern the Spring 2007 radar study. **Spring radar study:** Spring passage rates were the highest reported among similar studies conducted elsewhere in western New York. This high passage rate is consistent with a study conducted in Chautauqua County also adjacent to Lake Erie (though 25 miles away). One would expect higher passage rates adjacent to the Great Lakes due to a large water body's tendency to channel bird migratory behavior. In contrast, lower passage rates were collected from the neighboring Horizon New Grange Windpark.	Please see response to comment ID DEIS-0003-1.
DEIS-0003-8	New York State Department of Environmental Conservation	**Spring radar study:** The Spring mean flight altitude is the second highest reported anywhere in New York. The highest mean flight altitude is from the study conducted in Chautauqua County – also along the lakefront.	Please see response to comment ID DEIS-0003-1.
DEIS-0003-9	New York State Department of Environmental Conservation	**Spring radar study:** Only 3% of the targets were located at altitudes less than 394 feet. This is the lowest measured percentage of birds passing lower than the top of the turbine's wind-swept zone when compared to all sites studies in Western New York, regardless of the mean flight altitude.	Please see response to comment ID DEIS-0003-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-10	New York State Department of Environmental Conservation	**Conclusions.** The data collected during the 2006 Fall and 2007 Spring migration radar studies at Ball Hill Windpark indicate that the targets observed were less likely to be struck by turbine blades then compared to data collected at other wind power projects in western New York due to the higher mean flight level of passerines and the low percentage of targets in the rotor swept area. However, these indicators should be balanced to some degree by the higher number of passerines observed during Spring. It is important to point out that this review does not provide a distinction between potential impacts to bats vs. birds as individual target identification was not possible. To provide lead agency, other involved agencies, and the public with the ability to compare the results of Ball Hill avian studies with other sites around the state, two DEC Proposed Wind Sites in new York" and Publicly Available Raptor Migration Data for Proposed wind Sites in New York." Please see links to these pdf file documents found at http://www.dec.ny.gov/energy/40966.html	Please see response to comment ID DEIS-0003-1.
DEIS-0003-11	New York State Department of Environmental Conservation	**Appendix J Section G: Work Plan for Post Construction Bird and Bat Mortality Monitoring** **Section 3: Methodology** The *Draft Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects* (Guidelines) are at http://www.dec.ny.gov/energy/40966.html. A finalized version will be available shortly on the same website. These guidelines should be followed closely when designing post-construction studies.	Please see response to comment ID DEIS-0003-1.

Table 2.4-2 Ball Hill Response to Comments Received on the 2008 DEIS

Unique Comment ID	Commenter Name or Agency	Comment	Comment Response
DEIS-0003-12	New York State Department of Environmental Conservation	**Task 2: Acoustical Monitoring for Bats** DEC recommends that bat acoustical monitoring take place for the duration of the ground searches, from April 15 until November 1 during each year of study. This will cover the full breeding period and the majority of the Spring and Fall migratory periods, and allow for potential correlation between bat activity and estimated mortality. As currently specified in the DEIS, bat acoustical monitoring would only take place during the first year of post-construction study. In light of white nose syndrome and its devastating effects on New York State wintering bat populations, it is critical that the applicant work closely with the DEC in designing their eventual post construction survey.	Please see response to comment ID DEIS-0003-1.
Cultural Resources			
DEIS-0003-30	New York State Department of Environmental Conservation	**Cultural Resources.** Per New York State Office of Parks, Recreation, and Historic Preservation letter dated September 24, 2008, Noble Ball Hill Windpark will have an adverse impact on culture resources within the Area of Potential Impact surveyed. Consequently, the project sponsor must work in consultation with OPRHP to pursue feasible and prudent plans that avoid or mitigate the adverse impacts. DEIS Section 2.30 & 2.31 & Appendix S include a discussion of cultural resources in the project area and the Area of Potential Effect (APE) for visual impacts to historic resources as well as possible mitigation actions. Because the potential visual impacts to historic resources are closely linked to the visual assessment referenced above, DEC's comments regarding mitigation (as described in the above paragraph) apply here as well. Also, the OPRHP September 24, 2008 notes numerous additional visual simulations that should be accomplished as part of the FEIS.	The updated Project and potential impacts (including and updated Cultural Resources Surveys, see Appendix N of this FEIS) were outlined in the SDEIS, which NYSDEC submitted public comment on. The updated Project has considered these and a direct response to NYSDEC's comment on the SDEIS in Table 2.4-1.

3 References

American Wind Wildlife Institute (AWWI). 2015. Wind Turbine Interactions with Wildlife and their Habitats. A Summary of Research Results and Priority Questions. May 2015.

Edick, Rudyard. 2009. Personal Communication. New York State Department of Environmental Conservation letter to Mr. Daniel A. Spitzer, Esq. dated January 22, 2009 regarding SEQR for Noble Ball Hill Windpark DEIS.

Environmental Design & Research, Landscape Architecture, and Engineering, P.C. (EDR). 2015. Second Supplemental Environmental Impact Statement, Proposed Arkwright Summit Wind Farm Project, Town of Arkwright, Chautauqua County, New York. Accessed online at: https://s3.amazonaws.com/Citations/arkwright/Arkwight+Summit_SEIS2_Text.pdf. Accessed on December 29, 2015.

Chief Medical Officer of Health. 2010. *The Potential Health Impact of Wind Turbines.* May 2010. Available online at: http://health.gov.on.ca/en/common/ministry/publications/reports/wind_turbine/wind_turbine.pdf Accessed November on 8, 2016.

Herter, N. 2016. Email from Dr. Nancy Herter of the New York State Historic Preservation Office to Panamerican Consultants, Inc., Buffalo Branch Regarding archeological investigations at Map Documented Structures.. October 5, 2016.

Jain, A., P. Kerlinger, R. Curry, L. Slobodnik, J. Quant, and D. Pursell. 2009. *Annual Report for the Noble Bliss Windpark, LLC*, *Post-construction Bird and Bat Fatality Study – 2008.* Prepared for Noble Environmental Power, LLC.

Jain, A., P. Kerlinger, R. Curry, and L. Slobodnik. 2007. *Annual Report for the Maple Ridge Wind Power Project Post-construction Bird and Bat Fatality Study - 2006.* Report prepared for PPM Energy and Horizon Energy and Technical Advisory Committee for the Maple Ridge Project Study. May 2007.

Jain A., P. Kerlinger, L. Slobodnik, R. Curry, and K. Russell. 2011. *Annual Report for the Noble Wethersfield Windpark, LLC: Pre-construction Bird and Bat Fatality Study – 2010*. Prepared for Noble Environmental Power, LLC.

Massachusetts Departments of Environmental Protection and Public Health (MassDEP and MDPH). 2012. *Wind Turbine Health Impact Study: Report of Independent Expert Panel January 2012.* Accessed online at: http://www.mass.gov/eea/docs/dep/energy/wind/turbine-impact-study.pdf. January 2012.

New York State Department of Environmental Conservation (NYSDEC). 2000. *Assessing and Mitigating Visual Impacts* (NYSDEC Visual Policy). Issued by Division/Office of Environmental Permits, Albany, NY.

_____. 2016. Letter from Rudyard Edick, New York State Department of Environmental Conservation to Julie Goodway, Town Clerk, Town of Villenova regarding Ball Hill Wind Project, DEC Comments on Supplemental Draft Environmental Impact Statement (SDEIS). March 14 2016. NYSDEC 2016

Stantec Consulting. 2009. *Post-construction Monitoring at the Munnsville Wind Farm, New York, 2008*. Prepared for E.ON Climate and Renewables

_____. 2011. Cohocton and Dutch Hill Wind Farms Year 2 Post-Construction Monitoring Report, 2010 for the Cohocton and Dutch Hill Wind Farms in Cohocton, New York. Prepared for Canandaigua Power Partners, LLC and Canandaigua Power Partners II, LLC.

New York State Historic Preservation Office (SHPO). 2006. *2006 Guidelines for Wind Farm Development Cultural Resources Survey Work*. New York State Historic Preservation Office, Office of Parks, Recreation and Historic Preservation, Peebles Island, Waterford.

U.S. Department of Agriculture (USDA). 2007. "Census of Agriculture, County Profile: Chautauqua County." Accessed online at: http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/New_York/cp36013.pdf. Accessed on August 16, 2012.

U.S. Census Bureau. 2010. "State and County Quick Facts: Chautauqua County, New York." Accessed online at: http://quickfacts.census.gov/qfd/states/36/36013.html. Accessed on August 16, 2012.

United States Fish and Wildlife Service (USFWS). 2012. *Land-Based Wind Energy Guidelines*. March 23, 2012.

_____. 2013. *Eagle Conservation Plan Guidance, Module 1 – Land-based Wind Energy, Version 2*.

A Updated Tables and Figures

A-1 Updated Tables

Table A-1 Potential Soil Impacts Based on Soil Attributes and Project Component

Project Component	Total Impact (Acres)[1]	High Erosion Potential[2]	High Compaction Potential	Poor Drainage[3]	Shallow Bedrock[4]	Slope >15%	Prime Farmland[5]	Statewide Importance
SDEIS								
Construction Impacts	282.6	59.2	85.5	8.7	65.8	17.6	139.4	133.0
Operational Impacts	98.1	20.0	32.1	2.5	17.9	3.4	51.5	43.1
Temporary Soil Impact[6,7]	184.5	39.2	53.4	6.2	47.9	14.2	87.9	89.9
FEIS								
Construction Impacts[8,9]	205.2	34.5	49.0	3.8	55.0	2.6	101.7	99.8
Operational Impacts	55.5	8.4	10.9	1.0	14.4	0.4	28.8	26.0
Temporary Soil Impact[6,7]	149.8	26.0	38.1	2.8	40.7	2.3	72.9	73.8
Change from SDEIS to FEIS								
Construction Impacts	(-77.4)	(-24.7)	(-36.5)	(-4.9)	(-10.8)	(-15.0)	(-37.7)	(-33.2)
Operational Impacts	(-42.6)	(-11.6)	(-21.2)	(-1.5)	(-3.5)	(-3.0)	(-22.7)	(-17.1)
Temporary Soil Impact[6,7]	(-34.7)	(-13.2)	(-15.3)	(-3.4)	(-7.2)	(-11.9)	(-15.0)	(-16.1)

Notes:

1 Total impact is the total soils impacted by each Project component and does not represent a sum of the types of soils presented in this table.

2 Includes severe and very severe.

3 Includes poorly drained and very poorly drained.

4 Includes all bedrock less than 6 feet from the surface.

5 Includes prime farmland and prime farmland if drained.

6 Temporary impact on soils equals the construction impact minus the operational impacts. The construction impact includes all soil impacted during construction, which is inclusive of temporary and operational impacts.

7 Individual values may not add up to totals due to rounding.

8 Construction impacts are defined as areas where grading (temporary and permanent) would occur for the construction of Project facilities with the exception of the Transmission Line, which is not included in the impact on soils as grading is not anticipated to occur. If grading were to occur within the limit of disturbance for the Transmission Line, and up to an additional 51.4 acres of soils may be temporarily impacted.

9 As noted in Section 1.3.3 and represented in the drawings presented in Appendix C of this FEIS, Project Drawings, there are an additional 62.3 acres within the proposed limits of disturbance (LOD) where grading is not expected to occur, but additional disturbance may include limited tree clearing and/or other minimal temporary disturbance required for construction of the Project facilities.

Table A-2 Impacts on Farmland Soils[1, 2, 3, 4, 5]

Soil Type	Temporary Impact[6] (acres)	Permanent Impact (acres)
SDEIS		
Prime Farmland Soils	**74.0**	**28.3**
Prime Farmland if Drained	**65.5**	**23.1**
Farmland of Statewide Importance	**132.9**	**43.0**
SDEIS Total Impact on Farmland Soils	**272.4**	**94.4**
FEIS		
Prime Farmland Soils		
Chautauqua silt loam, 3 to 8% slopes	29.1	11.6
Chenango channery loam, fan, 3 to 8% slopes	0.6	0.1
Chenango gravelly loam, 0 to 3% slopes	0.2	3.2
Chenango gravelly loam, 3 to 8% slopes	1.0	0.8
Collamer silt loam, 3 to 8% slopes	0.0	0.2
Elnora fine sandy loam, 3 to 8% slopes	0.0	0.2
Pompton silt loam	0.0	0
Schuyler silt loam, 3 to 8% slopes	0.0	0.2
Valois gravelly silt loam, 3 to 8% slopes	4.1	1.5
Subtotal Prime Farmland Soils	**35.0**	**17.8**
Prime Farmland if Drained		
Barcelona silt loam, 3 to 8% slopes	0.0	0.0
Busti silt loam, 0 to 3% slopes	2.9	1.1
Busti silt loam, 3 to 8% slopes	31.4	8.9
Darien silt loam, 0 to 3% slopes	0.4	0.0
Fremont silt loam, 0 to 3% slopes	2.7	1.0
Hornell silt loam, 0 to 3% slopes	0.0	0.0
Niagara silt loam, 0 to 3% slopes, loamy substratum	0.0	0.0
Orpark silt loam, 0 to 3% slopes	0.0	0.0
Orpark silt loam, 3 to 8% slopes	0.3	0.0
Raynham silt loam, 0 to 3% slopes	0.0	0.0
Swormville silt loam	0.2	0.1
Subtotal Prime Farmland if Drained	**37.9**	**11.1**
Farmland of Statewide Importance		
Ashville silt loam	2.1	0.7
Busti silt loam, 8 to 15% slopes	0.2	0.1
Canandaigua silt loam, loamy substratum	0.0	0.0
Chautauqua silt loam, 8 to 15% slopes	8.2	2.2
Chenango gravelly loam, 8 to 15% slopes	1.2	0.0
Collamer silt loam, 8 to 15% slopes	0.0	0.2
Dalton silt loam, 0 to 3% slopes	2.6	0.2
Erie silt loam, 0 to 3% slopes	1.5	0.6
Erie silt loam, 3 to 8% slopes	15.4	3.3
Fremont silt loam, 3 to 8% slopes	13.7	4.9
Fremont silt loam, 8 to 15% slopes	1.8	0.4
Hornell silt loam, 3 to 8% slopes	0.0	0.0
Langford silt loam, 3 to 8% slopes	13.5	8.3

Table A-2 Impacts on Farmland Soils[1, 2, 3, 4, 5]

Soil Type	Temporary Impact[6] (acres)	Permanent Impact (acres)
Langford silt loam, 8 to 15% slopes	7.3	2.0
Orpark silt loam, 8 to 15% slopes	0.0	0.0
Schuyler silt loam, 8 to 15% slopes	0.3	0.1
Towerville silt loam, 8 to 15 percent slopes	0.0	0.0
Unadilla silt loam, 8 to 15% slopes	0.4	0.3
Valois gravelly silt loam, 8 to 15% slopes	0.6	0.4
Valois gravelly silt loam, rolling	5.0	2.3
Subtotal Farmland of Statewide Importance	**73.8**	**26.0**
FEIS Total Impact on Farmland Soils	**146.7**	**54.9**
Change from SDEIS to FEIS		
Prime Farmland Soils	**(-39.0)**	**(-10.5)**
Prime Farmland if Drained	**(-27.6)**	**(-12.0)**
Farmland of Statewide Importance	**(-59.1)**	**(-17.0)**
Change from SDEIS to FEIS Total Impact on Farmland Soils	**(-125.7)**	**(-39.5)**

Notes:

1 Soils data taken from SSURGO Database (USDA 2015).

2 Impacts to soils considers all Project facilities that would require grading. Clearing of the Transmission Line right of way (ROW) would not require grading and, therefore, would not impact soils and are not included in this table.

3 Individual acreages may not add up to totals due to rounding.

4 Impacts to soils are defined as areas where grading (temporary and permanent) would occur for the construction of Project facilities with the exception of the Transmission Line, which is not included in the impact on soils, as grading is not anticipated to occur. If grading were to occur within the limits of disturbance (LOD) for the Transmission Line, up to an additional 51.4 acres of soils may be temporarily impacted.

5 As noted in Section 1.3.3 of this FEIS and represented in the drawings presented in Appendix C of this FEIS, Project Drawings, there are an additional 62.3 acres within the proposed LOD where grading is not expected to occur, but additional disturbance may include limited tree clearing and/or other minimal temporary disturbance required for construction of the Project facilities.

6 Temporary impacts are considered to be areas to be restored after construction.

Table A-3 Project Eco-Community Impacts

Eco-Community Type	Construction Impacts (Permanent and Temporary Impacts) (acres[1,2,3])	Project Operational Impacts (Permanent Impacts) (acres)	Areas to be Restored After Construction (Temporary Impacts) (acres)
SDEIS			
Agriculture (Hayfields, Row Crops, Pastures)	134.3	44.5	89.8
Beech Maple Mesic[4]	31.6	31.6	0.0
Hemlock – Northern[4] Hardwoods	72.5	72.5	0.0
Open Water	0.3	0.3	0.0
Successional Northern[4] Hardwoods	51.5	51.5	0.0
Successional Old Field	21.5	10.3	11.2
Successional Shrubland	6.2	4.5	1.7
Tree Farm/Vineyard	12.2	8.9	3.3
Total	**330.1**	**149.9**	**180.1**
FEIS			
Agriculture (Hayfields, Row Crops, Pastures)	133.1	30.0	103.1
Beech Maple Mesic[4,5]	9.2	9.2	0.0
Hemlock – Northern[4,5] Hardwoods	38.3	38.3	0.0
Open Water	0.3	<0.1	0.3
Successional Northern[4,5] Hardwoods	50.4	50.4	0.0
Successional Old Field	12.9	3.7	9.2
Successional Shrubland	3.6	0.0	3.6
Tree Farm/Vineyard	8.8	4.0	4.9
Total	**256.6**	**55.5**	**201.2**
Change from SDEIS to FEIS			
Agriculture (Hayfields, Row Crops, Pastures)	(-1.2)	(-14.5)	13.3
Beech Maple Mesic[4]	(-22.4)	(-22.4)	0.0
Hemlock – Northern[4] Hardwoods	(-34.2)	(-34.2)	0.0
Open Water	0.0	(-0.3)	0.3
Successional Northern[4] Hardwoods	(-1.1)	(-1.1)	0.0
Successional Old Field	(-8.6)	(-6.6)	(-2.0)

Table A-3 Project Eco-Community Impacts

Eco-Community Type	Construction Impacts (Permanent and Temporary Impacts) (acres[1,2,3])	Project Operational Impacts (Permanent Impacts) (acres)	Areas to be Restored After Construction (Temporary Impacts) (acres)
Successional Shrubland	(-2.6)	(-4.5)	1.9
Tree Farm/Vineyard	(-3.4)	(-4.9)	1.6
Total	**(-73.5)**	**(-94.5)**	**21.0**

Notes:

1 The sum of temporary and permanent impacts may not exactly equal construction impacts due to rounding.
2 Construction impacts are defined as areas where grading (temporary and permanent) would occur for the construction of Project facilities with the exception of the Transmission Line for which construction impacts are considered to be the entire 80-foot ROW.
3 As noted in Section 1.3.3 of this FEIS and represented in the drawings presented in Appendix C of this FEIS, Project Drawings, there are an additional 62.3 acres within the proposed limits of disturbance (LOD) where grading is not expected to occur, but additional disturbance may include limited tree clearing and/or other minimal temporary disturbance required for construction of the Project facilities.
4 Impacts on forested ecological community types are considered permanent as NYSDEC staff considers the clearing of all forested habitat to be a permanent impact due to the time it takes a forest to regenerate to pre-construction conditions.
5 As described in Section 1.3.3, of this FEIS, an additional 21 acres of tree clearing would be required in the additional LOD area of the Project. In total, 118.9 acres of tree clearing is anticipated from the Project.

Land use data was derived from the USGS Land Use/Land Cover dataset (Fry et al. 2011); the acreages of eco-communities are defined based on field visits and aerial photo interpretation.

Table A-4 Potential Habitat Fragmentation, Ball Hill Wind Project (acres)[1]

Impact Type	Town of Hanover	Town of Villenova	Total
Direct[2]	61.4	36.6	97.9
Indirect[3]	535.8	446.6	982.3
Total	**597.2**	**483.2**	**1,080.2**

[1] Table totals may not add up due to rounding.
[2] Direct impacts equal the amount of clearing (acres) in the limits of disturbance (LOD) that will occur within forest blocks that are greater than 150 acres.
[3] Indirect impacts equal the amount land (acres) that is within a 300-foot buffer of the clearing that will occur.

Table A-5 Existing Land Use, Ball Hill Wind Project (acres)

Land Use/Land Cover	Town of Villenova	Town of Hanover	Total
SDEIS			
Agricultural[1]	3,443	2,184	5,627
Forested[2]	4,745	2,884	7,630
Developed[3]	216	178	394
Open Water	5	4	9
Total[4]	**8,409**	**5,250**	**13,659**
FEIS			
Agricultural[1]	3,263	998	4,261
Forested[2]	3,614	1,597	5,211
Developed[3]	168	63	231
Open Water	10	1	12
Total[4]	**7,055**	**2,659**	**9,715**
Change from SDEIS to FEIS			
Agricultural[1]	(-180)	(-1,186)	(-1,366)
Forested[2]	(-1,131)	(-1,287)	(-2,419)
Developed[3]	(-48)	(-115)	(-163)
Open Water	5	(-3)	3
Total[4]	**(-1,354)**	**(-2,591)**	**(-3,945)**

Source: Homer et al. 2015.

Notes:

[1] Agricultural land use includes the U.S. Geological Survey (USGS) Land Use/Land Cover categories of Pasture/Hay; Grassland/Herbaceous; Cultivated Crops; and Emergent Herbaceous Wetlands. Section 2.4, Wetlands, provides a summary of the acreages of wetlands that were field-delineated within the survey corridor.

[2] Forested land use includes the USGS Land Use/Land Cover categories of Deciduous Forest; Evergreen Forest; Mixed Forests; Scrub-Shrub; and Woody Wetlands. Section 2.4, Wetlands, provides a summary of the acreages of wetlands that were field-delineated within the survey corridor.

[3] Developed land use includes the USGS Land Use/Land Cover categories of Developed, Open Space; Developed Low Intensity; and Developed High Intensity.

[4] Table totals may not add up due to rounding.

Table A-6 Summary of Project Land Use Impacts, Entire Project Site

Land Use/ Land Cover	Construction Impacts (Permanent and Temporary Impacts) [acres]			Project Operational Impacts (Permanent Impacts) [acres]			Areas to be Restored to Existing Condition After Construction (Temporary Impacts) [acres]		
	Total[1,5]	Town of Hanover	Town of Villenova	Total[1]	Town of Hanover	Town of Villenova	Total[1]	Town of Hanover	Town of Villenova
SDEIS									
Agricultural[2]	161.8	58.1	103.6	65.8	36.9	28.9	96.0	21.2	74.7
Forested[3]	160.3	62.4	97.9	160.3	62.4	97.9	0.0	0.0	0.0
Developed[4]	8.0	3.4	4.6	2.2	1.7	0.5	5.8	1.7	4.1
SDEIS Total acreage	**330.1**	**124.0**	**206.1**	**228.3**	**101.0**	**127.3**	**101.8**	**22.9**	**78.8**
FEIS									
Agricultural	145.1	45.8	99.3	34.5	10.0	24.6	110.6	35.9	74.7
Forested[6]	101.5	59.7	41.8	20.1	8.6	11.5	81.5	51.1	30.4
Developed	10.0	3.4	6.5	0.9	0.1	0.7	9.1	3.3	5.8
FEIS Total acreage	**256.6**	**109.0**	**147.6**	**55.5**	**18.7**	**36.8**	**201.2**	**90.3**	**110.9**
Change from SDEIS to FEIS									
Agricultural	(-16.7)	(-12.3)	(-4.3)	(-31.3)	(-26.9)	(-4.3)	14.6	14.7	0.0
Forested	(-58.8)	(-2.7)	(-56.1)	(-140.2)	(-53.8)	(-86.4)	81.5	51.1	30.4
Developed	2.0	0.0	1.9	(-1.3)	(-1.6)	0.2	3.3	1.6	1.7
Total	**(-73.5)**	**(-14.9)**	**(-58.5)**	**(-172.8)**	**(-82.3)**	**(-90.5)**	**99.4**	**67.4**	**32.1**

Notes

[1] Individual values may not add up to totals due to rounding.

[2] Agricultural land use includes the U.S. Geological Survey (USGS) Land Use/Land Cover categories of Pasture/Hay; Grassland/Herbaceous; Cultivated Crops; and Emergent Herbaceous Wetlands. Appendix E, Wetland and Waterbodies, provides a summary of the acreages of wetlands that were field-delineated within the survey corridor.

[3] Forested land use includes the USGS Land Use/Land Cover categories of Deciduous Forest; Evergreen Forest; Mixed Forests; Shrub/Scrub; and Woody Wetlands. Section 2.4, Wetlands, provides a summary of the acreages of wetlands that were field-delineated within the survey corridor.

[4] Developed land use includes the USGS Land Use/Land Cover categories of Developed Open Space and Developed Low Intensity.

[5] As noted in Section 1.3.3 of this FEIS and represented in the drawings presented in Appendix C of this FEIS, Project Drawings, there are an additional 62.3 acres within the proposed limits of disturbance (LOD) where grading is not expected to occur but additional disturbance may include limited tree clearing and/or other minimal temporary disturbance required for construction of the Project facilities.

[6] As noted in Section 1.3.3,of this FEIS an additional 21 acres of tree clearing would be required in the additional LOD area of the Project. In total, 118.9 acres of tree clearing is anticipated from the Project.

A-2 Updated Figures

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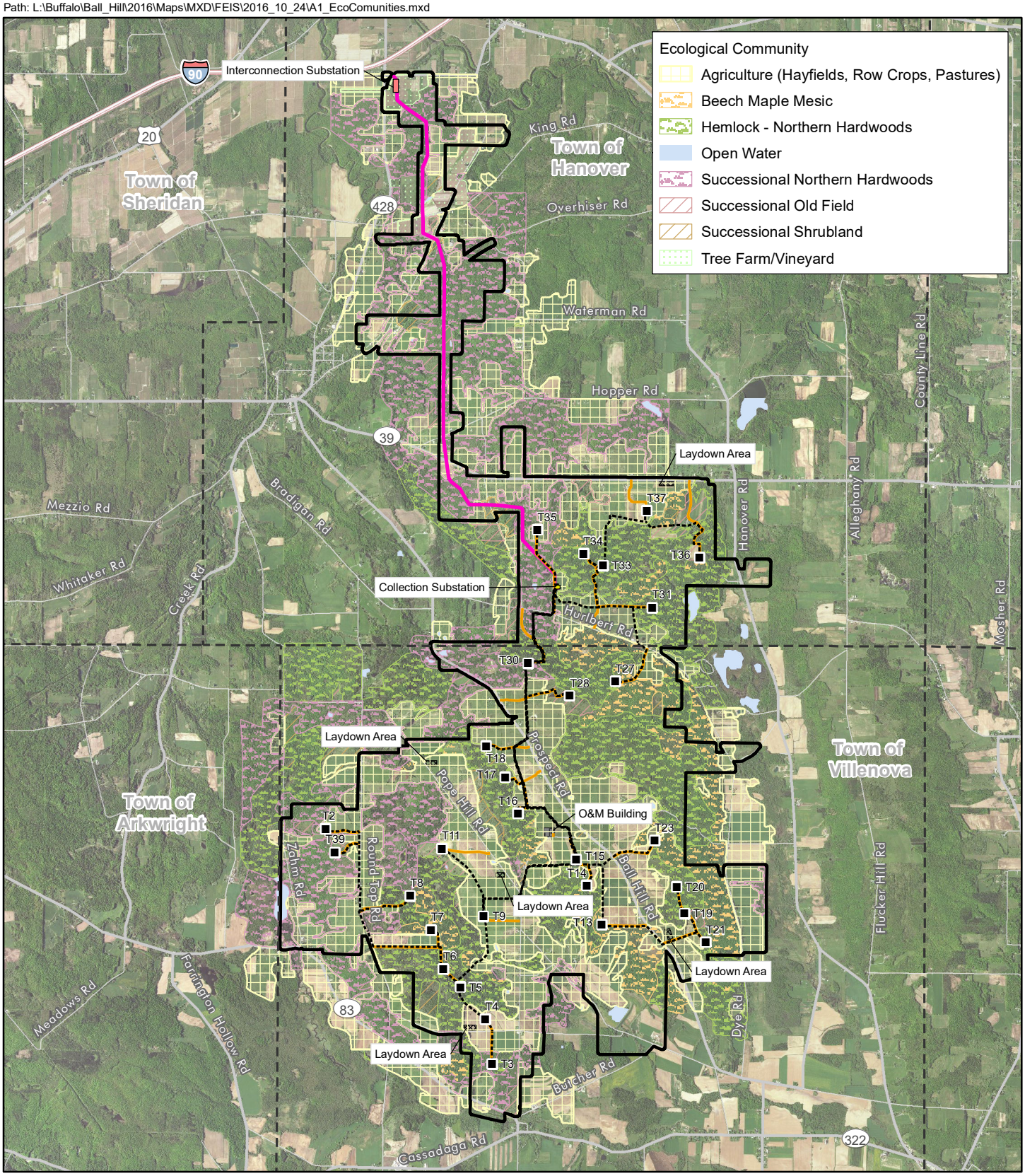

Turbine
Town Boundary
Street
Access Road
Collection Line
Transmission Line
Collection Substation
Interconnection Substation
O&M Building
Laydown Area
Project Area

Figure A-1
Ecological Community Types
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC

0 1 2 Miles

Ecological community data was collected based on the Project Area of the SDEIS. This data is not available for small areas on the eastern and southern edges of the revised, smaller Project Area. There are no data gaps within the Project Site and therefore all construction impacts on ecological communities are captured.

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

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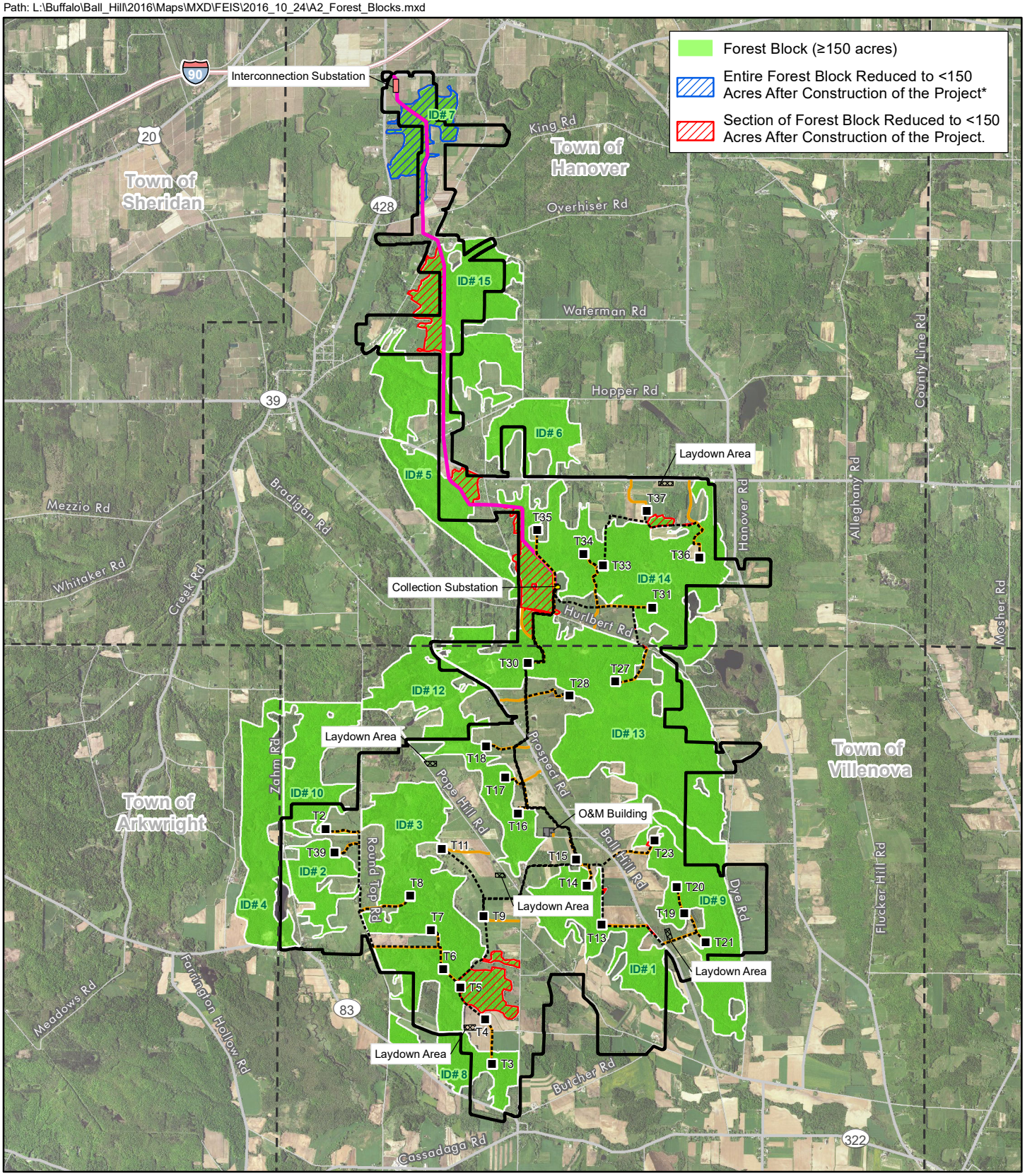

Turbine
Town Boundary
Street
Access Road
Collection Line
Transmission Line
Collection Substation
Interconnection Substation
O&M Building
Laydown Area
Project Area

Figure A-2
Forest Blocks ≥150 Acres
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC

0 1 2 Miles

Forest block #7 will be split by the construction workspace, resulting in a change in acreage from 211.4 acres to three smaller sections of 7.1, 89.6, and 105.6 acres each. While other contiguous forest blocks are split by the construction workspace, forest block #7 is the only one in which no contiguous block of ≥150 acres will remain after construction.

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

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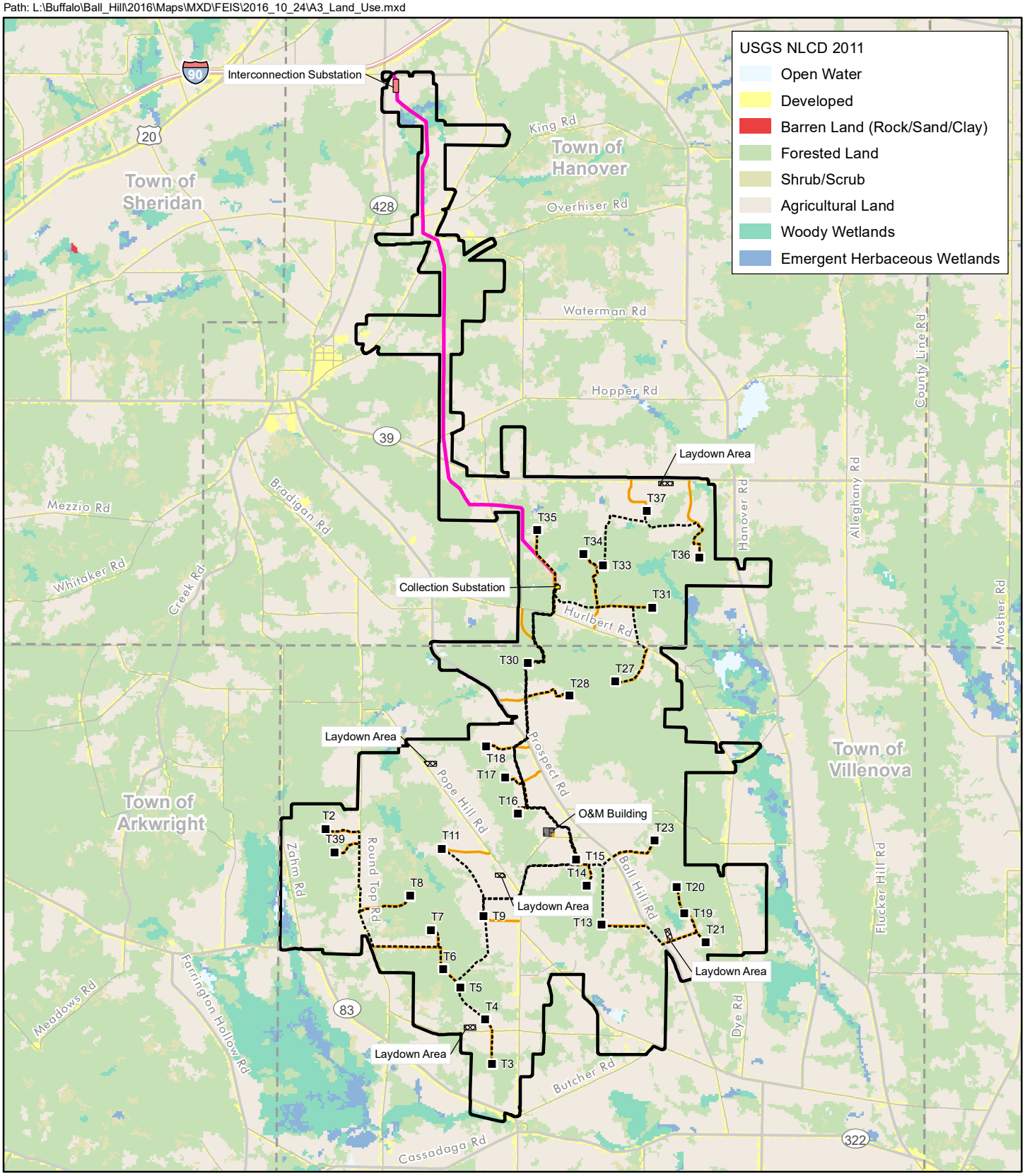

Turbine
Town Boundary
Street
Access Road
Collection Line
Transmission Line
Collection Substation
Interconnection Substation
O&M Building
Laydown Area
Project Area

Figure A-3
Land Use Types
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC

0 1 2 Miles

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015; USGS National Land Cover Dataset 2011.

Ball Hill Wind Project

Proposed Infrastructure:

- Turbine (87m hub height)
- Junction Box
- Transmission Line
- Access Road
- Collection
- Substation/Switchyard Proposed to be Fenced
- Laydown Area
- O & M Building/Laydown

- Wind Overlay District
- Wind Overlay District Buffer
- 1.5 Tower Height Radius (428ft)
- 1200' Radius
- 500' Radius
- Town Boundary

Structure:

- Participating Residence
- Non-participating Residence
- Non-residential Structure

Renewable Energy Systems

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COORDINATE SYSTEM: NY West Zone, NAD83
LAYOUT NUMBER:
DRAWN BY: AP DATE: 9/7/2016
DRAWING NO.: 23105D6914-01

0 2,000
Feet
1 inch equals 2,000 feet

This drawing is the property of RES America Developments Inc. and no reproduction may be made in whole or in part without permission.

Figure A-4: Zoning Setback Map
Ball Hill Wind Project, Chautauqua County, New York
Ball Hill Wind Energy LLC

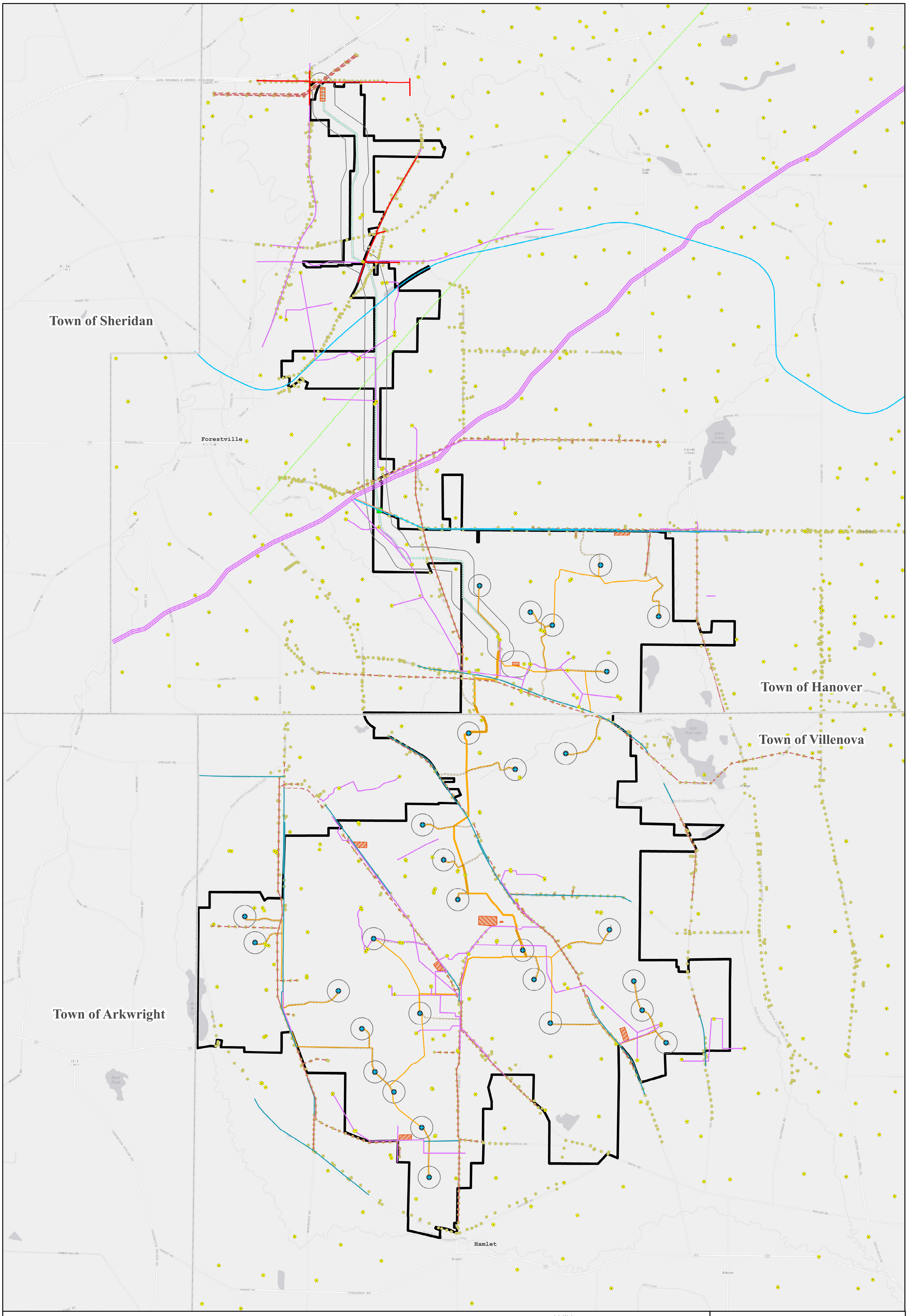


Figure A-5: Utility Setback Map
Ball Hill Wind Project, Chautauqua County, New York
Ball Hill Wind Energy LLC

B Turbine Specifications

B-1 Vestas Model V126-3.45MW IEC IIA/IIB Product Brochure

Vestas®

3 MW PLATFORM

Wind. It means the world to us.™

Are you looking for the maximum return on **your investment** in wind energy?

Wind energy means the world to us. And we want it to mean the world to our customers, too, by maximising your profits and strengthening the certainty of your investment in wind power.

That's why, together with our partners, we always strive to deliver cost-effective wind technologies, high quality products and first class services throughout the entire value chain. And it's why we put so much emphasis on the reliability, consistency and predictability of our technology.

We have more than 35 years' experience in wind energy. During that time, we've delivered more than 70 GW of installed capacity in 75 countries. That is more than 15 per cent of total wind turbine capacity installed globally – and over 15 GW more than our closest competitor. We currently monitor over 28,000 wind turbines across the globe. All tangible proof that Vestas is the right partner to help you realise the full potential of your wind site.

What is the 3 MW Platform today?
The 3 MW platform was introduced in 2010 with the launch of the V112-3.0 MW®. Over 8 GW of the 3 MW platform has been installed all over the world onshore and offshore making it the obvious choice for customers looking for highly flexible and trustworthy turbines.

Since then the 3 MW platform was upgraded and new variants were introduced utilising untapped potential of the platform. All variants carry the same nacelle design and the hub design has been re-used to the largest extend possible. In addition, our engineers have increased the nominal power across the entire platform improving your energy production significantly.

With this expansion, the 3 MW platform covers all IEC wind classes with a variety of rotor sizes and a higher rated output power of 3.45 MW.

You can choose from the following turbines on the 3 MW platform:
- V105-3.45 MW™ – IEC IA
- V112-3.45 MW™ – IEC IA
- V117-3.45 MW™ – IEC IB/IEC IIA
- V126-3.45 MW™ – IEC IIB
- V126-3.45 MW™ – IEC IIA
- V136-3.45 MW™ – IEC IIIA

All variants of the 3 MW platform are based on the proven technology of the V112-3.0 MW® with a full-scale converter, providing you with superior grid performance.

Our 3 MW platform is designed for a broad range of wind and site conditions, enabling you to mix turbines across your site or portfolio of sites, delivering industry-leading reliability, serviceability and exceptional energy capture optimising your business case.

All turbine variants are equipped with the same ergonomically designed and very spacious nacelle which makes it easier for maintenance crews to gain access, so they can reduce the time spent on service while maximizing the uptime without compromising safety. All turbines can be installed and maintained using standard installation and servicing tools and equipment further reducing the operation and maintenance costs by minimising your stock level of spare parts.

+56,000

The V112-3.45 MW® and the other 3 MW variants advance the already proven technology powering over 56,000 installed Vestas turbines worldwide - more than any other supplier.

How does our technology generate **more energy?**

More power for every wind site
V112-3.45 MW™, V117-3.45 MW™, V126-3.45 MW™ and V136-3.45 MW™ are available with several noise modes to meet sound level restrictions with an optimised production. The power system enables superior grid support and it is capable of maintaining production across severe drops in grid voltage, while simultaneously minimising tower and foundation loads. It also allows rapid down-rating of production to 10 per cent nominal power.

Proven technologies - from the company that invented them
The 3 MW platform is a low-risk choice. It is based on the proven technologies that underpin more than 56,000 Vestas turbines installed around the world. Using the best features from across the range, as well as some of the industry's most stringently tested components and systems, the platform's reliable design minimises downtime – helping to give you the best possible return on your investment.

With an operating range that covers all wind classes, our 3 MW platform delivers unrivalled energy production. The proven blade technology from the V112-3.0 MW® is used on the V105-3.45 MW™, the V112-3.45 MW™ and on the V117-3.45 MW™. The industry known structural shell blades are used on the V126-3.45 MW™ and V136-3.45 MW™- a technology which is also used on the 2 MW V110-2.0 MW™ variant.

Reliable and robust
The Vestas Test Centre is unrivalled in the wind industry. We test most nacelle components using Highly Accelerated Life Testing (HALT) to ensure reliability. For critical components, HALT identifies potential failure modes and mechanisms. Specialised test rigs ensure strength and robustness for the gearbox, generator, yaw and pitch system, lubrication system and accumulators. Our quality-control system ensures that each component is manufactured to design specifications and performs at site. We systematically monitor measurement trends that are critical to quality, locating defects before they occur.

The 3 MW platform covers all wind segments enabling you to find the best turbine for your specific site.

WINDCLASSES - IEC

TURBINE TYPE	IEC III (6.0 - 7.5 m/s)	IEC II (7.5 - 8.5 m/s)	IEC I (8.5 - 10.0 m/s)
3 MW TURBINES			
V105-3.45 MW™ IEC IA			■
V112-3.45 MW™ IEC IA			■
V117-3.45 MW™ IEC IB/IEC IIA		■	■
V126-3.45 MW™ IEC IIA		■	■
V126-3.45 MW™ IEC IIB	■	■	
V136-3.45 MW™ IEC IIIA	■	■	

■ Standard IEC conditions ■ Site dependent

Options available for the 3 MW platform

An option is an extra feature that can be added to the turbine to suit a project's specific needs. By adding options to the standard turbine, we can enhance the performance and adaptability of the wind power project and facilitate a shorter permitting cycle at restricted sites. The options can even be a decisive factor in realising your specific project, and the business case certainty of the investment.

Here is a list of the options available for the 3 MW platform:

- Power Optimised Mode
- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Vestas De-Icing
- Low Temperature Operation to - 30°C
- Fire Suppression
- Shadow detection
- Increased Cut-In
- Nacelle Hatch for Air Inlet
- Aviation Lights
- Aviation Markings on the Blades
- Obstacle Collision Avoidance System (OCAS™)

Life testing

The Vestas Test Centre has the unique ability to test complete nacelles using technologies like Highly Accelerated Life Testing (HALT). This rigorous testing of new components ensures the reliability of the 3 MW platform.

Is the 3 MW platform the optimal choice for **your specific site?**

One common nacelle – five different rotor sizes
The wind conditions on a wind project site are often not identical. The 3 MW platform features a range of turbines that cover all wind classes and combined across your site they can maximise the energy output of your wind power plant.

Tip-height restrictions and strict grid requirements
With a rotor size of 105 m, the V105-3.45 MW™ IEC IA is the turbine that fits the most severe wind conditions. It has an extremely robust design for tough site conditions and is especially suited for markets with tip-height restrictions and high grid requirements.

Like all the other 3 MW turbines, the V105-3.45 MW™ is equipped with a full-scale converter ensuring full compliance with the challenging grid codes in countries like the UK and Ireland.

Cold climates
The V112-3.45 MW™, V117-3.45 MW™ , V126-3.45MW™ and V136-3.45 MW™ can be combined with Vestas De-Icing and Vestas Ice Detection ensuring optimum production in cold climates.

The Vestas De-Icing System is fully SCADA integrated and can be triggered automatically or manually depending on your de-icing strategy. Automatic control protects your investment, optimising the trigger point so the turbine only stops to de-ice when there is an expected net power production gain.

High- and medium-wind sites
The V112-3.45 MW™ IEC IA is a high-wind turbine and has a very high capacity factor. Similar to the other 3 MW turbines, the V112-3.45 MW™ IEC IA turbine makes efficient use of its grid compatibility and is an optimal choice for sites with MW constraints.

On medium wind-sites the V117-3.45 MW™ IEC IB/IEC IIA, V126-3.45 MW™ IEC IIA and V126-3.45 MW™ IEC IIB are excellent turbine choices. A combination of the variants can optimise your site layout and improve your production significantly on complex sites.

Low-wind sites
Built on the same proven technology as the V112-3.0 MW®, the V136-3.45 MW™ IEC IIIA is our best performer on low-wind sites. The larger rotor enable greater wind capture, which in turn produces more energy to reduce levelised cost of energy (LCOE). The result is exceptional profitability in areas with low wind, and new frontiers for wind energy investment.

Large Diameter Steel Towers (LDST) support the added rotor size and rating of Vestas turbines to increase Annual Energy Production on low-wind sites.

LDST is specially designed with a larger diameter in the bottom section that allows for optimal strength at high hub heights.

Maximising old permits
Although the V136-3.45 MW™ is one of the highest producing low wind turbine available, some old permits may simply be too tight to accept it. Although the V117-3.45 MW™ and V126-3.45 MW™ are medium-wind turbines, they still deliver an excellent business case on low-wind sites.

Due to the similar electrical properties and nacelle design, it is easy to mix and match the turbines from the 3 MW platform to maximise production on heavily constrained sites.

Would you **benefit** from uninterrupted control of wind energy production?

Knowledge about wind project planning is key
Getting your wind energy project up and operating as quickly as possible is fundamental to its long-term success. One of the first and most important steps is to identify the most suitable location for your wind power plant. Vestas' SiteHunt® is an advanced analytical tool that examines a broad spectrum of wind and weather data to evaluate potential sites and establish which of them can provide optimum conditions for your project.

In addition, SiteDesign® optimises the layout of your wind power plant. SiteDesign® runs Computational Fluid Dynamics (CFD) software on our powerful in-house supercomputer Firestorm to perform simulations of the conditions on site and analyse their effects over the whole operating life of the plant. Put simply, it finds the optimal balance between the estimated ratio of annual revenue to operating costs over the lifetime of your plant, to determine your project's true potential and provide a firm basis for your investment decision.

The complexity and specific requirements of grid connections vary considerably across the globe, making the optimal design of electrical components for your wind power plant essential. By identifying grid codes early in the project phase and simulating extreme operating conditions, Electrical PreDesign provides you with an ideal way to build a grid compliant, productive and highly profitable wind power plant. It allows customised collector network cabling, substation protection and reactive power compensation, which boost the cost efficiency of your business.

Advanced monitoring and real-time plant control
All our wind turbines can benefit from VestasOnline® Business, the latest Supervisory Control and Data Acquisition (SCADA) system for modern wind power plants.

This flexible system includes an extensive range of monitoring and management functions to control your wind power plant. VestasOnline® Business enables you to optimise production levels,

+28,000

The Vestas Performance and Diagnostics Centre monitors more than 28,000 turbines worldwide. We use this information to continually develop and improve our products and services.

monitor performance and produce detailed, tailored reports from anywhere in the world. The VestasOnline® Power Plant Controller offers scalability and fast, reliable real-time control and features customisable configuration, allowing you to implement any control concept needed to meet local grid requirements.

Surveillance, maintenance and service

Operating a large wind power plant calls for efficient management strategies to ensure uninterrupted power production and to control operational expenses. We offer 24/7 monitoring, performance reporting and predictive maintenance systems to improve turbine performance and availability. Predicting faults in advance is essential, helping to avoid costly emergency repairs and unscheduled interruptions to energy production.

Our Condition Monitoring System (CMS) assesses the status of the turbines by analysing vibration signals. For example, by measuring the vibration of the drive train, it can detect faults at an early stage and monitor any damage. This information allows pre-emptive maintenance to be carried out before the component fails, reducing repair costs and production loss.

Additionally, our Active Output Management® (AOM) concept provides detailed plans and long term agreements for service and maintenance, online monitoring, optimisation and troubleshooting. It is possible to get a full scope contract, combining your turbines' state-of-the-art technology with guaranteed time or energy-based availability performance targets, thereby creating a solid base for your power plant investment. The Active Output Management® agreement provides you with long term and financial operational peace of mind for your business case.

V105-3.45 MW™ IEC IA

Facts & figures

POWER REGULATION	Pitch regulated with variable speed

OPERATING DATA

Rated power	3,450 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	25 m/s
Re cut-in wind speed	23 m/s
Wind class	IEC IA

Standard operating temperature range from -20°C* to +45°C with de-rating above 30°C

*subject to different temperature options

SOUND POWER

(Noise modes dependent on site and country)

ROTOR

Rotor diameter	105 m
Swept area	8,659 m²
Air brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Frequency	50/60 Hz
Converter	full scale

GEARBOX

Type	two planetary stages and one helical stage

TOWER

Hub height	72.5 m (IEC IA)

NACELLE DIMENSIONS

Height for transport	3.4 m
Height installed (incl. CoolerTop®)	6.9 m
Length	12.8 m
Width	4.2 m

HUB DIMENSIONS

Max. transport height	3.8 m
Max. transport width	3.8 m
Max. transport length	5.5 m

BLADE DIMENSIONS

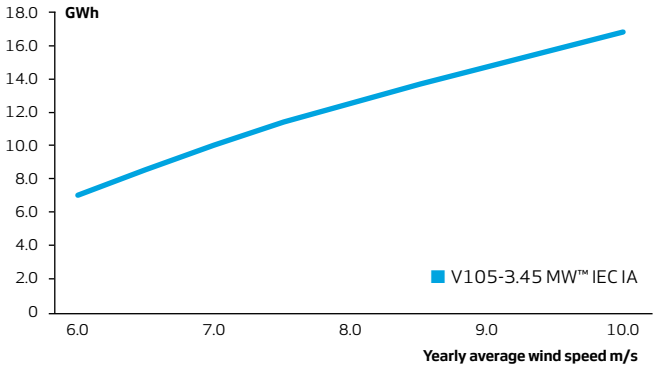
Length	51.2 m
Max. chord	4 m

Max. weight per unit for transportation	70 metric tonnes

TURBINE OPTIONS

- Power Optimised Mode
- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Low Temperature Operation to -30°C
- Fire Suppression
- Shadow Detection
- Increased Cut-In
- Nacelle Hatch for Air Inlet
- Aviation Lights
- Aviation Markings on the Blades
- Obstacle Collision Avoidance System (OCAS™)

ANNUAL ENERGY PRODUCTION



Assumptions
One wind turbine, 100% availability, 0% losses, k factor =2, Standard air density = 1.225, wind speed at hub height

V112-3.45 MW™ IEC IA

Facts & figures

POWER REGULATION	Pitch regulated with variable speed

OPERATING DATA

Rated power	3,450 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	25 m/s
Re cut-in wind speed	23 m/s
Wind class	IEC IA

Standard operating temperature range from -20°C* to +45°C with de-rating above 30°C

*subject to different temperature options

SOUND POWER

(Noise modes dependent on site and country)

ROTOR

Rotor diameter	112 m
Swept area	9,852 m²
Air brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Frequency	50/60 Hz
Converter	full scale

GEARBOX

Type	two planetary stages and one helical stage

TOWER

Hub height	69 m (IEC IA) and 94 m (IEC IA)

NACELLE DIMENSIONS

Height for transport	3.4 m
Height installed (incl. CoolerTop®)	6.9 m
Length	12.8 m
Width	4.2 m

HUB DIMENSIONS

Max. transport height	3.8 m
Max. transport width	3.8 m
Max. transport length	5.5 m

BLADE DIMENSIONS

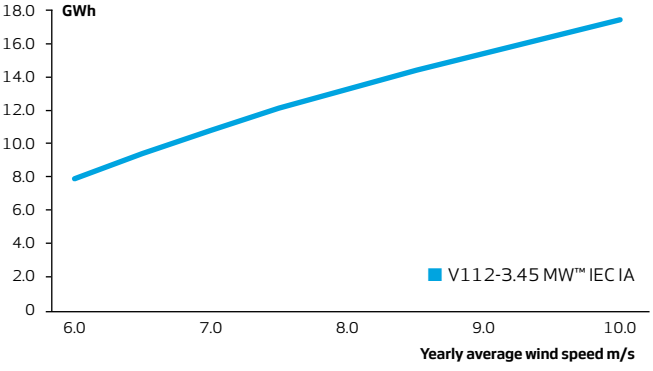
Length	54.7 m
Max. chord	4 m

Max. weight per unit for transportation	70 metric tonnes

TURBINE OPTIONS

- Power Optimised Mode
- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Vestas De-Icing
- Low Temperature Operation to - 30°C
- Fire Suppression
- Shadow detection
- Increased Cut-In
- Nacelle Hatch for Air Inlet
- Aviation Lights
- Aviation Markings on the Blades
- Obstacle Collision Avoidance System (OCAS™)

ANNUAL ENERGY PRODUCTION



Assumptions
One wind turbine, 100% availability, 0% losses, k factor =2, Standard air density = 1.225, wind speed at hub height

V117-3.45 MW™ IEC IB/IEC IIA

Facts & figures

POWER REGULATION	Pitch regulated with variable speed

OPERATING DATA

Rated power	3,450 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	25 m/s
Re cut-in wind speed	23 m/s
Wind class	IEC IB/IEC IIA

Standard operating temperature range from -20°C* to +45°C with de-rating above 30°C

*subject to different temperature options

SOUND POWER

(Noise modes dependent on site and country)

ROTOR

Rotor diameter	117 m
Swept area	10,751 m²
Air brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Frequency	50/60 Hz
Converter	full scale

GEARBOX

Type	two planetary stages and one helical stage

TOWER

Hub heights	80 m (IEC IB), 91.5 m (IEC IB) and 116.5 m (IEC IB/IEC IIA/DIBtS)

NACELLE DIMENSIONS

Height for transport	3.4 m
Height installed (incl. CoolerTop®)	6.9 m
Length	12.8 m
Width	4.2 m

HUB DIMENSIONS

Max. transport height	3.8 m
Max. transport width	3.8 m
Max. transport length	5.5 m

BLADE DIMENSIONS

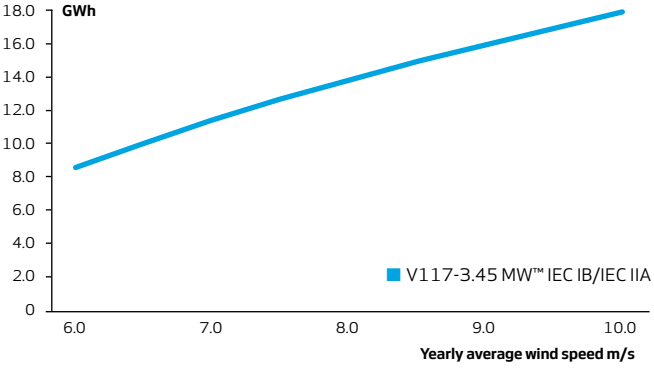
Length	57.2 m
Max. chord	4 m

Max. weight per unit for transportation	70 metric tonnes

TURBINE OPTIONS

- Power Optimised Mode
- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Vestas De-Icing
- Low Temperature Operation to - 30°C
- Fire Suppression
- Shadow detection
- Increased Cut-In
- Nacelle Hatch for Air Inlet
- Aviation Lights
- Aviation Markings on the Blades
- Obstacle Collision Avoidance System (OCAS™)

ANNUAL ENERGY PRODUCTION



Assumptions
One wind turbine, 100% availability, 0% losses, k factor =2, Standard air density = 1.225, wind speed at hub height

V126-3.45 MW™ IEC IIB

Facts & figures

POWER REGULATION	Pitch regulated with variable speed

OPERATING DATA

Rated power	3,450 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	22.5 m/s
Re cut-in wind speed	20 m/s
Wind class	IEC IIB

Standard operating temperature range from -20°C* to +45°C with de-rating above 30°C

*subject to different temperature options

SOUND POWER

(Noise modes dependent on site and country)

ROTOR

Rotor diameter	126 m
Swept area	12,469 m²
Air brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Frequency	50/60 Hz
Converter	full scale

GEARBOX

Type	two planetary stages and one helical stage

TOWER

Hub heights	87 m (IEC IIB), 117 m (IEC IIB) and 137 m (IEC IIIA)

NACELLE DIMENSIONS

Height for transport	3.4 m
Height installed (incl. CoolerTop®)	6.9 m
Length	12.8 m
Width	4.2 m

HUB DIMENSIONS

Max. transport height	3.8 m
Max. transport width	3.8 m
Max. transport length	5.5 m

BLADE DIMENSIONS

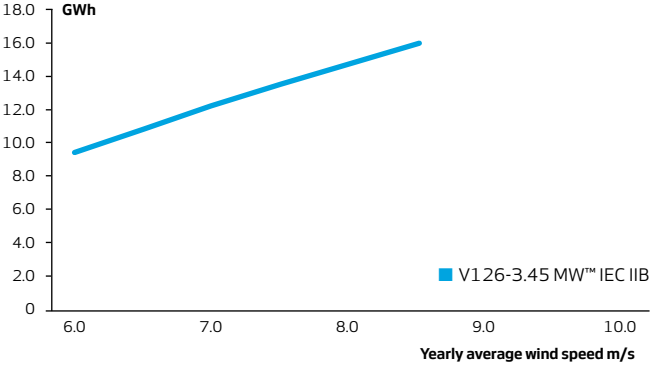
Length	61.7 m
Max. chord	4 m

Max. weight per unit for transportation	70 metric tonnes

TURBINE OPTIONS

- Power Optimised Mode
- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Vestas De-Icing
- Low Temperature Operation to - 30°C
- Fire Suppression
- Shadow detection
- Increased Cut-In
- Nacelle Hatch for Air Inlet
- Aviation Lights
- Aviation Markings on the Blades
- Obstacle Collision Avoidance System (OCAS™)

ANNUAL ENERGY PRODUCTION



Assumptions
One wind turbine, 100% availability, 0% losses, k factor =2, Standard air density = 1.225, wind speed at hub height

V126-3.45 MW™ IEC IIA

Facts & figures

POWER REGULATION	Pitch regulated with variable speed

OPERATING DATA

Rated power	3,450 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	22.5 m/s
Re cut-in wind speed	20 m/s
Wind class	IEC IIA

Standard operating temperature range from -20°C* to +45°C with de-rating above 30°C

*subject to different temperature options

SOUND POWER

(Noise modes dependent on site and country)

ROTOR

Rotor diameter	126 m
Swept area	12,469 m²
Air brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Frequency	50/60 Hz
Converter	full scale

GEARBOX

Type	two planetary stages and one helical stage

TOWER

Hub heights	87 m (IEC IIA), 117 m (IEC IIA/DIBtS), 137 m (IEC IIIA/DIBtS), 147 m (IEC IIIA), 149 m (DIBtS) and 166 m (DIBtS)

NACELLE DIMENSIONS

Height for transport	3.4 m
Height installed (incl. CoolerTop®)	6.9 m
Length	12.8 m
Width	4.2 m

HUB DIMENSIONS

Max. transport height	3.8 m
Max. transport width	3.8 m
Max. transport length	5.5 m

BLADE DIMENSIONS

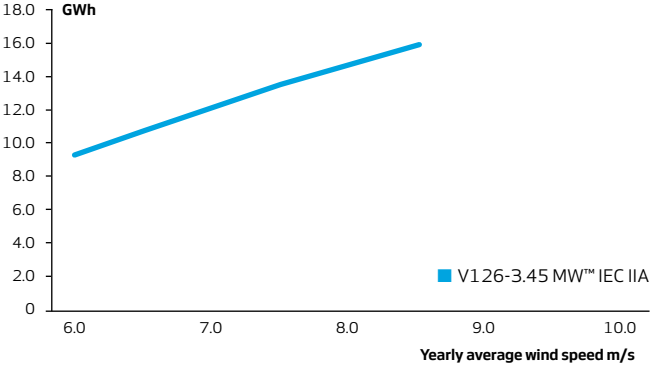
Length	61.7 m
Max. chord	4 m

Max. weight per unit for transportation	70 metric tonnes

TURBINE OPTIONS

- Power Optimised Mode
- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Vestas De-Icing
- Low Temperature Operation to - 30°C
- Fire Suppression
- Shadow detection
- Increased Cut-In
- Nacelle Hatch for Air Inlet
- Aviation Lights
- Aviation Markings on the Blades
- Obstacle Collision Avoidance System (OCAS™)

ANNUAL ENERGY PRODUCTION



Assumptions
One wind turbine, 100% availability, 0% losses, k factor =2, Standard air density = 1.225, wind speed at hub height

V136-3.45 MW™ IEC IIIA

Facts & figures

POWER REGULATION — Pitch regulated with variable speed

OPERATING DATA

Rated power	3,450 kW
Cut-in wind speed	3 m/s
Cut-out wind speed	22.5 m/s
Re cut-in wind speed	20 m/s
Wind class	IEC IIIA

Standard operating temperature range from -20°C* to +45°C with de-rating above 30°C

*subject to different temperature options

SOUND POWER

(Noise modes dependent on site and country)

ROTOR

Rotor diameter	136 m
Swept area	14,527 m²
Air brake	full blade feathering with 3 pitch cylinders

ELECTRICAL

Frequency	50/60 Hz
Converter	full scale

GEARBOX

Type	two planetary stages and one helical stage

TOWER

Hub heights	82 m (IEC IIIA), 112 m (IEC IIIA), 132 m (IEC IIIA/DIBt2) and 149 m (DIBtS)

NACELLE DIMENSIONS

Height for transport	3.4 m
Height installed (incl. CoolerTop®)	6.9 m
Length	12.8 m
Width	4.2 m

HUB DIMENSIONS

Max. transport height	3.8 m
Max. transport width	3.8 m
Max. transport length	5.5 m

BLADE DIMENSIONS

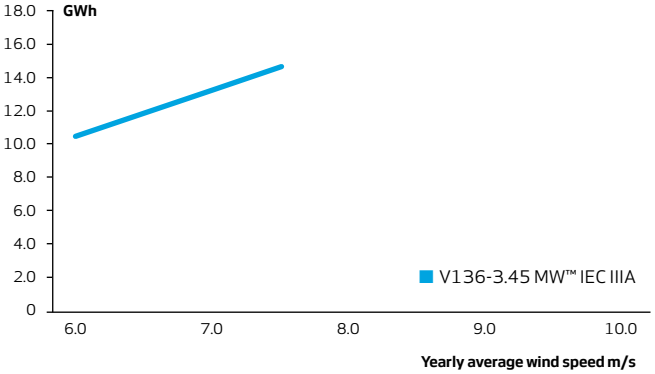
Length	66.7 m
Max. chord	4.1 m

Max. weight per unit for transportation	70 metric tonnes

TURBINE OPTIONS

- Condition Monitoring System
- Service Personnel Lift
- Vestas Ice Detection
- Vestas De-Icing
- Low Temperature Operation to - 30°C
- Fire Suppression
- Shadow detection
- Increased Cut-In
- Nacelle Hatch for Air Inlet
- Aviation Lights
- Aviation Markings on the Blades
- Obstacle Collision Avoidance System (OCAS™)

ANNUAL ENERGY PRODUCTION



Assumptions
One wind turbine, 100% availability, 0% losses, k factor =2, Standard air density = 1.225, wind speed at hub height

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10/2015-EN

B-2 Vestas Model V126-3.45MW Type Certificate

PUBLIC

DNV·GL

TYPE CERTIFICATE

Certificate No.:	Issued:	Valid until:
TC-DNV-DSS-904-00337-0 (TC-230906-A-3)	2015-09-17	2019-10-30

Issued for:

Vestas V126-3.3 MW / V126-3.45 MW

Specified in Annex 1

Issued to:

Vestas Wind Systems A/S

Hedeager 42
8200 Aarhus N
Denmark

According to:

IEC 61400-22:2010 Wind turbines – Part 22: Conformity Testing and Certification, BEK 73: 2013 "Bekendtgørelse om teknisk certificeringsordning for vindmøller" and DNV-DSS-904:2014-01 Type Certification of Wind Turbines

Based on the documents:

DB-DNV-DSS-904-00772-0 (DB-230906-A-3)	Design Basis Conformity Statement, dated 2015-09-17
DE-DNV-DSS-904-00774-0 (DE-230906-A-4)	Design Evaluation Conformity Statement, dated 2015-09-17
TT-DNV-DSS-904-00775-0 (TT-230906-A-3)	Type Test Conformity Statement, dated 2015-09-17
ME-DNV-DSS-904-00776-0 (MC-230906-A-3)	Manufacturing Evaluation Conformity Statement, dated 2015-09-17
TCM-DNV-DSS-904-00777-0 (TM-230906-A-3)	Type Characteristics Measurements Conformity Statement, dated 2015-09-17
FER-TC-DNV-DSS-904-00337-0 (PD-2309-18CGY6P-36, Rev 4)	Final Evaluation Report, dated 2015-09-17

Changes of the system design, the production and erection or the manufacturer's quality system are to be approved by DNV GL.

Hellerup, 2015-09-17

For the accredited certification body
Germanischer Lloyd Industrial Services GmbH

Christer Eriksson
Service Line Leader Type Certification

DAkkS Deutsche Akkreditierungsstelle D-ZE-11053-01-00

By DAkkS according DIN EN IEC/ISO 17065 accredited Certification Body for products. The accreditation is valid for the fields of certification listed in the certificate.

Hellerup, 2015-09-17

For the accredited certification body
Germanischer Lloyd Industrial Services GmbH

Niels Dam Lerke
Project Manager

The latest edition of the "General Terms & Conditions of Germanischer Lloyd Industrial Services GmbH" is applicable. German law applies.
Germanischer Lloyd Industrial Services GmbH, Brooktorkai 18, 20457 Hamburg, Germany

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Original Instruction: T05 0047-9868 VER 03

T05 0047-9868 Ver 03 - Approved - Exported from DMS: 2016-08-10 by PHDKN

PUBLIC

Original Instruction: T05 0047-9868 VER 03

TYPE CERTIFICATE – ANNEX 1

Wind turbine type certification

Basic standard	IEC 61400-1 ed. 3 + A1
IEC WT class	IEC IIIA and IEC IIIB (except for temperature ranges) – V126-3.3 MW IEC S – V126-3.45 MW

General

Power regulation	pitch-controlled
Rotor orientation	upwind
Rotor tilt	6°
Cone angle	4°
Rated power	3300 kW / 3450 kW
Rated wind speed v_r	10.70 m/s
Rotor diameter	126m
Hub height(s)	117m (T3E160 – IEC IIIB/S) 137m (LDST – IEC IIIA/S) 87m (T3E155 – IEC IIIA/S)
Hub height operating wind speed range v_{in} - v_{out}	3 -22.5 m/s (117m and 137m) 3 -20 m/s (87m)
Design life time	20 years
Software version	13.08.56

Wind conditions

	IEC IIIA	IEC IIIB	IEC S
Mean turbulence intensity I_{ref} at v_{hub} = 15 m/s	0.16	0.14	0.16/0.14
Annual average wind speed at hub height v_{ave}	7.5 m/s	7.5 m/s	6.9 m/s
Reference wind speed v_{ref}	37.5 m/s	37.5 m/s	37.5 m/s
Mean flow inclination	8°	8°	8°

Electrical network conditions

Normal supply voltage and range	3 x 650 V 10.5-35 kV ± 10 %
Normal supply frequency and range	50 or 60 Hz ± 6 %
Voltage imbalance	IEC 61000-3-6 TR max 2 %
Maximum duration of electrical power network outages	Two 3 months periods
Number of electrical network outages	Max 52 per year

Other environmental conditions

Air density	1.225 / 1.325[i] kg/m^3 [i]To account for low temperature operation, Vestas has applied higher air density for the following load cases: 1.2, 2.1, 3.1, 4.1 and 5.1
Standard temperature range	Normal: -20 °C to +45 °C* Extreme: -40 °C to +50 °C
Low temperature range	Normal: -30 °C to +45 °C* Extreme: -40 °C to +50 °C (*de-rating strategy above +30 ºC for V126-3.3MW *de-rating strategy above +25 ºC for V126-3.45MW)
Relative humidity of the air	100% (max 40% of time) and 90% (rest of life time)
Solar radiation	1000 W/m^2
Salinity	ISO 9223: Airborne salinity S3

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TYPE CERTIFICATE – ANNEX 1

Description of lightning protection system

Designed acc. to IEC 61400-24, Protection Level 1 and IEC 61312-1

Major components

Blade	Type	Infused structural air foil shell
	Manufacturer	Vestas
	Material	Carbon fibres pultrusions, glass fibre fabrics, balsa and PET foam core
	Blade length	61.65 m
	Air brake	Full span blade feather
	Number of blades	3
	Drawing / Data sheet / Part no.	Drawing No : 0028-7875 Drawing No : 0046-1000 - V126 STE kit
Hub	Type	Cast ball shell hub
	Material	EN GJS-400-18U-LT
	Drawing / Data sheet / Part no.	085210
Blade bearing	Type	Double row four-point contact ball bearing
	Manufacturer	Laulagun
	Drawing / Data sheet / Part no.	F2840M00DST0125VW
Pitch System	Type	Hydraulic power unit
	Hydraulic/Electrical unit	PMC Technology A/S
	Actuators	LJM, Glual or Parker
Main shaft	Type	Cast hollow shaft
	Material	EN GJS-400-18U-LT
	Drawing / Data sheet / Part no.	085196 / 29024367
Main bearing	Type	Double-row spherical roller bearing
	Manufacturer	SKF
	Drawing / Data sheet / Part no.	240/950 CA/C3LW 33VQ113
	Manufacturer	FAG Schaeffler
	Drawing / Data sheet / Part no.	240/950 F-582562.PRL.WPOS
Gearbox	Type	2 Planetary stages and one helical stage
	Manufacturer	Winergy
	Gear Ratio	112.6
	Drawing / Data sheet / Part no.	PZAB3530.1
	Type	2 Planetary stages and one helical stage
	Manufacturer	ZF
	Gear Ratio	112.8
	Drawing / Data sheet / Part no.	EH921A
Couplings	Main shaft-Main gear	Shrink disc
	Manufacturer	Tollok
	Type	TLK622 990x1350

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TYPE CERTIFICATE – ANNEX 1

	Main gear-Generator	Flexible composite coupling
	Manufacturer	KTR Kupplungstechnik GmbH
	Type	RADEX-N 2200kpl.m.Lamellenp
Machine foundation	Type	Cast
	Material	EN GJS-400-18U-LT
	Drawing / Data sheet / Part no.	29006988
Yaw system	Drive type	Nacelle mounted electrical driven plain bearing with external toothing
	Yaw bearing type	Friction bearing, permanently pre-tensioned
	Yaw drive type	Liebherr type DAT350/1492-4000 Comer type PG 1603 Bonfiglioli type 709T4U
	Yaw brake type	Electrical disc brake in yaw motors
	Yaw speed	0.46 °/s
Mechanical brakes	Manufacturer	Eurotubi / Vestas
	Type	Disc brake
	Location	High speed shaft of gearbox
	Brake torque	Min. 17.4 kNm (static)
Generator	Manufacturer	Siemens (not valid for V126-3.45MW)
	Type	Three phase induction generator with squirrel cage rotor - JGWA-560LM-06A
	Rated power	3500kW
	Voltage	750 V
	Nominal Speed	1450 rpm
	Insulation class	F
	Protection class (acc. to IEC 529)	IP54
	Manufacturer	Siemens
	Type	Three phase induction generator with squirrel cage rotor - JGWA-560LM-06A
	Rated voltage	750 V
	Rated power	3650 kW
	Rated current	3440 A
	Cos phi	0.82
	Rated speed	1450 rpm
	Protection class (acc. to IEC 529)	IP54
	Rated frequency	72.2 Hz
	Insulation class	F
	Manufacturer	VND
	Type	Three phase induction generator with squirrel cage rotor - DASG 560/6M
	Nominal power	3650 kW
	Voltage	750 V
	Nominal Speed	1450 rpm
	Insulation class	H
	Protection class (acc. to IEC 529)	IP54

Original Instruction: T05 0047-9868 VER 03

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VESTAS PROPRIETARY NOTICE

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TYPE CERTIFICATE – ANNEX 1

	Manufacturer	VND SFIG_V2
	Type	Three phase induction generator with squirrel cage rotor - DASG 560/6M
	Rated power	3650 kW
	Rated voltage	750 V
	Rated frequency	72.5 Hz
	Rated power factor (VFD) – Cos phi	0.87
	Insulation class stator	H
	Protection class (acc. to IEC 529)	IP54
	Rated speed	1450 rpm
	Rated stator current	3230 A
Transformer	Manufacturer	SGB / Siemens
	Type	Dry-type transformer
	Nominal power	3750 kVA
	Environmental Tests	E2 according to IEC 60076-11
	Climatic Tests	C2 according to IEC 60076-11
Protection system	Description	Configurable safety system based on safety relays
Tower	Type	Tubular steel tower
	Hub height	117m
	Drawing / Data sheet / Part no.	0038-9831.V01
	Type	Tubular steel tower
	Hub height	87m
	Drawing / Data sheet / Part no.	0050-2668.V00
	Type	Large diameter steel tower
	Hub height	137m
	Drawing / Data sheet / Part no.	0041-4092.V04
Control System	Manufacturer	Vestas
	Type	Vestas Multi Processor VMP Global
Lift	Manufacturer	Avanti
	Type	Avanti Dolphin service lift
Crane	Manufacturer	Star 071/95 Liftket
	Type	max 800 kg
Manuals	O&M manual	See list of manuals 0006-6955, Rev. 24
	Transport manual	See list of manuals 0040-6996, Rev. 8
	Installation / Commissioning manual	See list of manuals 0040-6996, Rev. 8

Original Instruction: T05 0047-9868 VER 03

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VESTAS PROPRIETARY NOTICE

B-3 Vestas Model V126-3.45MW Typical Vertical Drawing

Figure 10: Vertical Drawing of Vestas V126 Wind Energy Turbine

Inset photograph of V126 Access Door

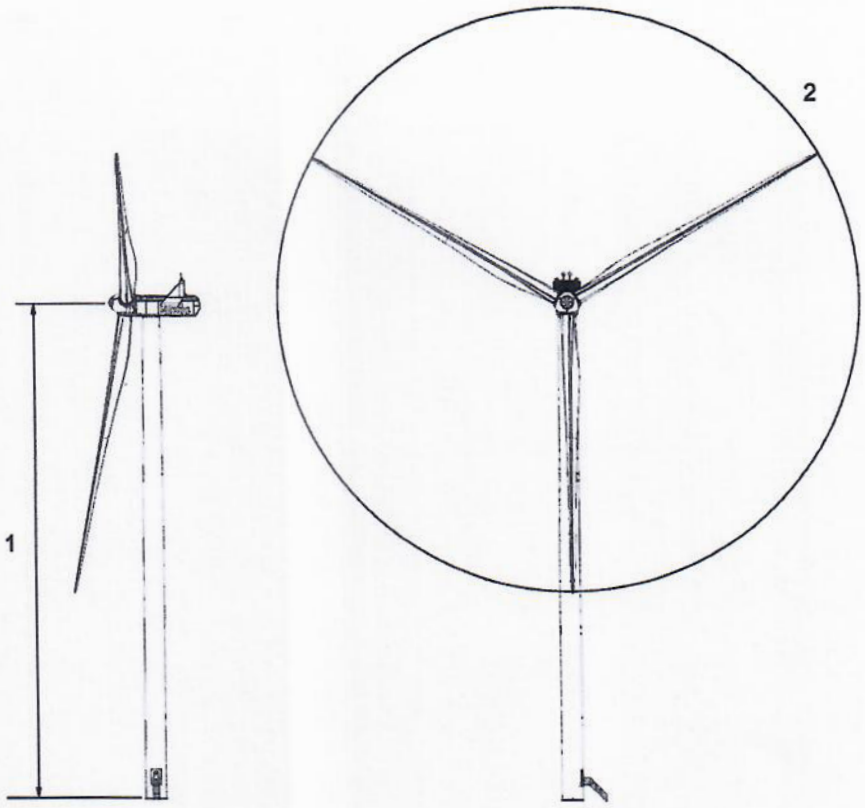


Figure 4-1: Illustration of outer dimensions – structure

1 Hub height 87/117/137 m **2** Diameter: 126 m

Vestas.

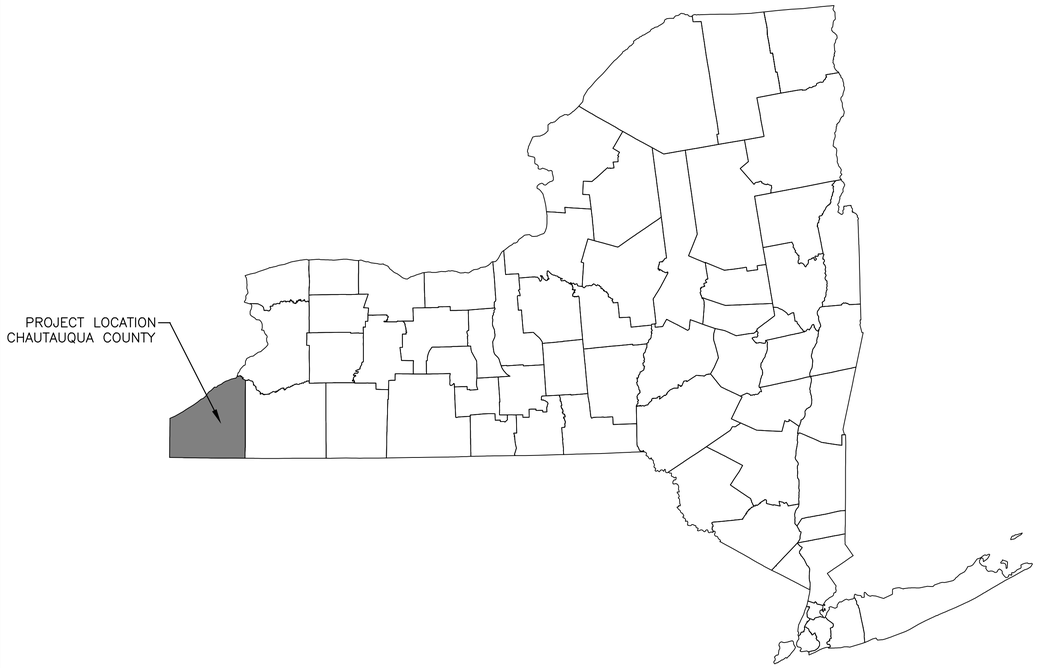
C Project Drawings

C-1 Project Drawings – Generation Portion

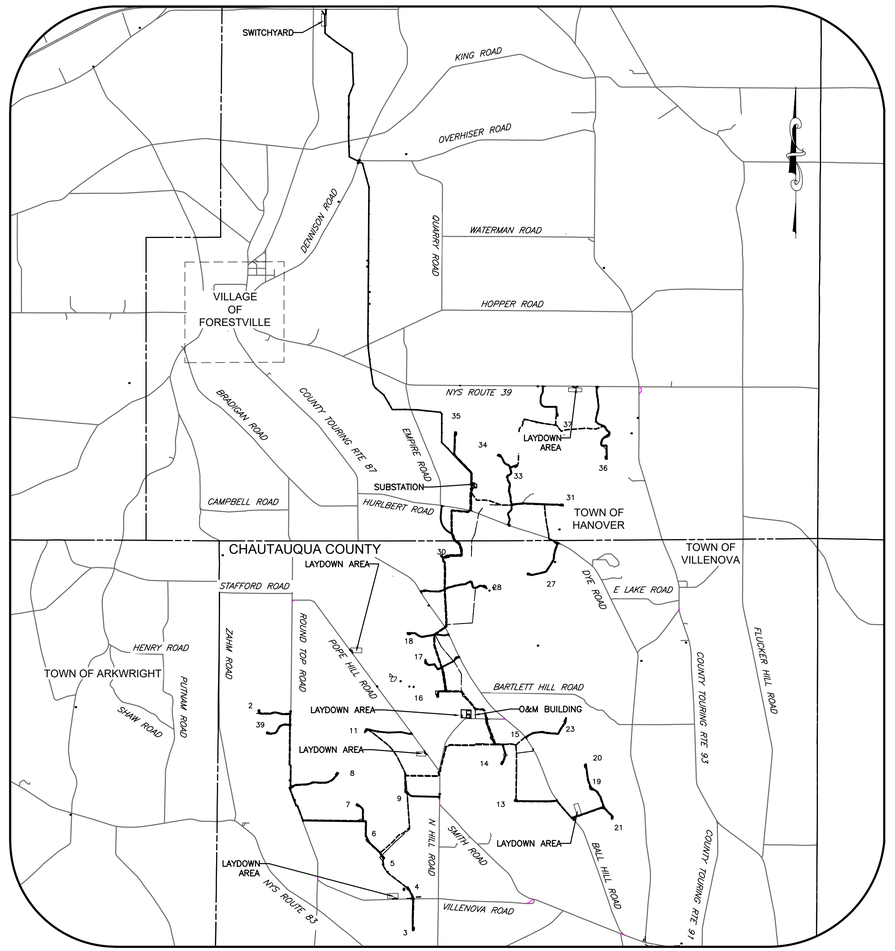
BALL HILL WIND PROJECT

PRELIMINARY PLANS

TOWNS OF HANOVER AND VILLENOVA
CHAUTAUQUA COUNTY



NEW YORK STATE MAP
N.T.S.



LOCATION MAP
N.T.S.

INDEX OF DRAWINGS:

PLAN SET NO.	DRAWING NO.	DESCRIPTION
1 OF 82	CV-1	COVER SHEET
2 OF 82	GP-1	GENERAL PLAN
3 OF 82	GN-1	GENERAL NOTES AND LEGEND
4 OF 82	GN-2	GENERAL NOTES
5 OF 82	TP-1	TRANSPORTATION ROUTE PLAN
6 OF 82	IND-C	PLAN INDEX
7-40 OF 82	C-100 THRU C-133	PLAN SHEETS
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DESIGNER CONTACT STATEMENT

FISHER ASSOCIATES IS RESPONSIBLE FOR THE DESIGN OF THIS PROJECT. STEVE WILKINSON IS THE DESIGNER AND IS FAMILIAR WITH NYSDOT STANDARDS AND REQUIREMENTS AND SHALL BE CONTACTED AT (585) 334-1310 TO RESOLVE ISSUES OR PROBLEMS DURING CONSTRUCTION. ALL REVISIONS, INCLUDING REVISIONS NECESSARY DUE TO FIELD CONDITIONS, SHALL BE APPROVED BY THE NYSDOT.

CONSTRUCTION INSPECTION

THE WORK WITHIN THE NYSDOT RIGHT-OF-WAY FOR THIS PROJECT WILL REQUIRE FULL TIME INSPECTION BY A NYSDOT APPROVED INSPECTOR. IT WILL BE THE RESPONSIBILITY OF THE DEVELOPER TO COORDINATE AND PAY ALL FEES ASSOCIATED WITH THIS INSPECTION.

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New York State Education Law, Section 7209 states that it is a violation of law for any person, unless he is acting under the direction of a licensed professional engineer or land surveyor, to alter an item in any way. If an item bearing the seal of an engineer or land surveyor is altered, the altering engineer or land surveyor shall affix to the item his/her seal and the notation "altered by" followed by his/her signature and the date of such alteration, and a specific description of the alteration.

FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
VT, TK
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

FISHER ASSOCIATES
WWW.FISHERASSOC.COM

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
COVER SHEET

DRAWING NO.
CV-1

SHEET 1 OF 81

TOWN OF SHERIDAN

TOWN OF PERRYSBURG

SWITCHYARD

KING ROAD

OVERHISER ROAD

DENNISON ROAD

QUARRY ROAD

WATERMAN ROAD

HOPPER ROAD

VILLAGE OF FORESTVILLE

NYS ROUTE 39

BRADIGAN ROAD

COUNTY TOURING RTE 87

EMPIRE ROAD

CAMPBELL ROAD

HURLBERT ROAD

SUBSTATION

LAYDOWN AREA

TOWN OF HANOVER

TOWN OF VILLENOVA

CHAUTAUQUA COUNTY

LAYDOWN AREA

STAFFORD ROAD

DYE ROAD

E LAKE ROAD

HENRY ROAD

TOWN OF ARKWRIGHT

PUTNAM ROAD

SHAW ROAD

ZAHM ROAD

ROUND TOP ROAD

POPE HILL ROAD

BARTLETT HILL ROAD

LAYDOWN AREA

O&M BUILDING

LAYDOWN AREA

N HILL ROAD

SMITH ROAD

LAYDOWN AREA

BALL HILL ROAD

LAYDOWN AREA

NYS ROUTE 83

VILLENOVA ROAD

COUNTY TOURING RTE 93

COUNTY TOURING RTE 91

FLUCKER HILL ROAD

35 34 33 37 36 31 30 28 27 18 17 16 2 39 11 15 23 14 20 19 8 13 21 9 7 6 5 4 3

2500 0 2500 5000 7500
FEET
Scale: 1"=2500'

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FA PROJECT NO.
150001

PROJECT MANAGER
P. McCARTHY

DRAWN BY
VT, TK

SCALE
AS SHOWN

ISSUE DATE
OCT. 2016

FISHER ASSOCIATES
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PROJECT:
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
TURBINE GENERAL PLAN

DRAWING NO.
GP-1

SHEET 2 OF 81

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1. PROJECT COORDINATES ARE IN NAD83 NEW YORK STATE PLANES, WEST ZONE – US FOOT.

2. ELEVATIONS AND CONTOURS WERE PROVIDED BY RES AMERICAS. ALL OTHER PLANIMETRIC FEATURES AND ORTHOPHOTOS WAS DERIVED FROM PUBLICLY AVAILABLE DATA. FISHER ASSOCIATES COMPLETED TOPOGRAPHIC SURVEY OF MISCELLANEOUS AREAS DURING 2016.

3. THE ELEVATIONS SHOWN ON THESE DRAWINGS ARE TO BE CONSIDERED GUIDANCE AND SHOULD BE ADJUSTED TO FIT ACTUAL FIELD CONDITIONS DURING CONSTRUCTION. THE CONTRACTOR SHALL USE JUDGEMENT WHEN ESTABLISHING CONSTRUCTION GRADES AND ELEVATIONS.

4. PROPERTY AND RIGHT–OF–WAY INFORMATION SHOWN IS DERIVED BY TAX MAPS.

5. FROM THE CONTROL POINTS AND BENCHMARKS PROVIDED BY THE OWNER'S ENGINEER, THE CONTRACTOR SHALL SUPPLY ALL CONSTRUCTION SURVEYING AND STAKING REQUIRED TO BUILD THE PROJECT IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR EXTRACTING STAKING COORDINATES FROM THE CONSTRUCTION DRAWINGS PROVIDED BY THE OWNER'S ENGINEER. ELECTRONIC COPIES OF THE CONSTRUCTION DRAWINGS WILL BE PROVIDED TO THE CONTRACTOR IF REQUESTED. ALL STAKEOUT SHALL BE APPROVED BY THE OWNER PRIOR TO CONSTRUCTION.

6. ALL MATERIALS AND SOILS SHALL BE DISPOSED OF IN PERMITTED DISPOSAL SITES. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ADDITIONAL NYSDEC PERMITTED DISPOSAL SITES.

7. THE CONTRACTOR SHALL APPLY FOR AND SECURE PERMITS FROM THE STATE AS NECESSARY BEFORE DRIVING CONSTRUCTION EQUIPMENT OVER AND ACROSS THE STATE HIGHWAYS AND ROADS.

8. MATERIALS USED SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE STATE OF NEW YORK DEPARTMENT OF TRANSPORTATION (NYSDOT) "STANDARD SPECIFICATIONS AND DETAILS".

9. WORK WITHIN A STATE RIGHT–OF–WAY SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE NEW YORK DEPARTMENT OF TRANSPORTATION (NYSDOT) "STANDARD SPECIFICATIONS AND DETAILS" AND "NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS".

10. ALL WORK PERFORMED WITHIN A STATE RIGHT–OF–WAY SHALL BE IN ACCORDANCE WITH THE PERMIT ISSUED BY THE NEW YORK DEPARTMENT OF TRANSPORTATION ON FILE WITH THE OWNER'S ENGINEER AND PROVIDED TO THE CONTRACTOR. THE CONTRACTOR SHALL OBTAIN AND PROVIDE AN INDIVIDUAL HIGHWAY PERMIT BOND BEFORE BEGINNING WORK ON STATE RIGHT–OF–WAY.

11. SOIL DISTURBANCE LIMITS ARE SHOWN ON THE CONSTRUCTION DRAWINGS. THE CONTRACTOR SHALL KEEP ALL EARTHWORK ACTIVITY BETWEEN THESE LIMITS. OTHER CONSTRUCTION ACTIVITY INCLUDING TRAVELING BETWEEN TURBINE SITES, MATERIAL STORAGE, EROSION CONTROL MEASURES, AND TREE TRIMMING ARE RESTRICTED TO WITHIN THE CONSTRUCTION EASEMENTS ON LEASED PROPERTIES ONLY.

12. THE CONTRACTOR SHALL DISPOSE OF ALL EXCESS SOIL RESULTING FROM THE CONSTRUCTION OF THE ROADS OR TURBINE FOUNDATIONS IN AN APPROVED MANNER. NO TOPSOIL WILL BE ALLOWED TO LEAVE THE PROPERTY FROM WHICH IT WAS DUG. EXCESS TOPSOIL SHALL BE DISTRIBUTED INTO A THIN LAYER ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. WHILE DOING SO THE CONTRACTOR SHALL AVOID CAUSING RIDGES OR MOUNDS THAT WOULD MAKE IT DIFFICULT TO CULTIVATE THE PROPERTY OR THAT WOULD CAUSE RAINWATER TO POND. THE FINAL SURFACE OF THE DISTRIBUTED TOPSOIL SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND. ALL OTHER SOIL THAT WOULD NOT BE CLASSIFIED AS TOPSOIL SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT A DISPOSAL SITE ARRANGED FOR BY THE CONTRACTOR. THE CONTRACTOR SHALL OBSERVE ALL APPLICABLE EPA AND NYSDEC RULES AND REGULATIONS DURING THE HANDLING AND DISPOSAL OPERATION.

13. THE FINISHED SURFACE OF CRANE PAD SHALL NOT SLOPE MORE THAN 1% IN ANY DIRECTION. THE CRANE PAD SHALL BE CONSTRUCTED AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER.

14. THE CONTRACTOR SHALL PROOF ROLL THE SUBGRADE PRIOR TO ANY AGGREGATE MATERIALS BEING PLACED. THE PROOF ROLL OPERATIONS SHOULD COMPLY WITH THE GEOTECHNICAL ENGINEER RECOMMENDATIONS. IF IT RAINS BETWEEN THE TIME THE FINISHED CRANE PAD SURFACE IS PROOF ROLLED AND THE WTG ERECTION CRANE IS TO BE USED ON THE CRANE PAD, THE CRANE PAD SURFACE SHALL BE PROOF ROLLED AGAIN TO SHOW THAT RAIN HAS NOT WEAKENED IT.

15. OVER LEGAL WEIGHT VEHICLES SHALL FOLLOW THE DESIGNATED DELIVERY ROUTE ONLY.

16. PERMANENT PIPE CULVERTS SHALL BE SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE. TEMPORARY PIPE CULVERT EXTENSION MATERIALS SHALL BE DETERMINED BY THE CONTRACTOR. TEMPORARY CULVERTS SHALL BE CHOSEN BASED ON ANTICIPATED EXPOSURE TO OVERWEIGHT CONSTRUCTION TRAFFIC.

17. CONTRACTOR SHALL FIELD VERIFY THE LENGTHS OF ALL PIPE CULVERTS TO BE REMOVED AND INSTALLED PRIOR TO ORDERING THE PIPE.

18. CULVERT INVERTS SHALL BE DETERMINED DURING INSTALLATION TO PROVIDE POSITIVE FLOW IN THE DIRECTION OF EXISTING SLOPES. CONTRACTOR TO INSTALL AT ADEQUATE DEPTHS AND DAYLIGHT TO DRAIN.

19. THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY BEFORE ANY CONSTRUCTION WORK HAS BEGUN, OF OBTAINING FROM ALL UTILITIES THE EXACT LOCATION OF ANY UNDERGROUND FACILITIES IN THE AREA OF CONSTRUCTION, WHETHER INDICATED ON THE PLANS OR NOT. WHENEVER A QUESTION ARISES REGARDING THE EXISTENCE OR LOCATION OF A BURIED UTILITY, CALL THE TOLL FREE TELEPHONE NUMBER, 1–800–632–4949, BEFORE STARTING EXCAVATION. ALLOW 48 HOURS FOR OTHER THAN EMERGENCY ASSISTANCE.

20. ANY FACILITIES DISTURBED BY THE CONTRACTOR SHALL BE RESTORED AT CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL COORDINATE WITH THE PROPER UTILITY FOR THE RELOCATION OF ANY FACILITY DESIGNATED ON THE PLANS OR DEEMED NECESSARY TO BE RELOCATED IN ORDER TO COMPLETE CONSTRUCTION OF THE PROJECT.

21. RESIDENTS SHALL BE NOTIFIED OF IMPENDING SERVICE OUTAGES AND NO RESIDENCE SHALL BE WITHOUT SERVICE OVERNIGHT DUE TO CONSTRUCTION ACTIVITIES.

22. ALL ROADS SHALL REMAIN OPEN TO THROUGH TRAFFIC DURING CONSTRUCTION ON THE PRIVATE SITES.

23. THE CONTRACTOR SHALL BE REQUIRED TO RELOCATE OR TO REMOVE AND RE–INSTALL ALL ROAD SIGNS WHICH INTERFERE WITH CONSTRUCTION OPERATIONS AND TO TEMPORARILY RESET ALL SUCH SIGNS DURING CONSTRUCTION.

24. ALL WORK INVOLVING SIGNS SHALL BE GOVERNED BY THE FOLLOWING REQUIREMENTS:
 * SIGNS SHALL NOT BE MOVED UNTIL PROGRESS OF WORK DEMANDS.
 * EVERY SIGN REMOVED MUST BE RE–ERECTED AT A TEMPORARY LOCATION IN A WORKMANLIKE MANNER AND BE VISIBLE TO HIGHWAY TRAFFIC.
 * ALL SUCH SIGNS MUST BE MAINTAINED STRAIGHT AND NEAT FOR THE DURATION OF THE TEMPORARY SETTING.
 * THE LATEST EDITION OF THE NATIONAL "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

25. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKERS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION. ALL OTHER EXISTING ROW MARKERS AND/OR PROPERTY PINS SHALL BE MAINTAINED OR REPLACED BY THE CONTRACTOR IN ACCORDANCE WITH NEW YORK LAW.

26. A CONCRETE WASH OUT AREA SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS AT EACH TURBINE LOCATION.

27. ALL DEBRIS SHALL BE DISPOSED OF OFF–SITE AT LOCATIONS PROVIDED BY THE CONTRACTOR.

28. CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE FROM ACCESS ROADS, EXCAVATIONS AND STAGING AREAS AROUND THE TURBINE SITES.

29. THE INTENT OF THE PLANS IS TO LOCATE THE ACCESS ROADS ALONG THE EDGE OF FIELDS AND TOP OF BANKS.

30. CONTRACTOR IS RESPONSIBLE FOR ALL TURNAROUNDS AND CRANE BUILD AREAS. THEIR LOCATIONS ON THE PLANS ARE APPROVED LOCATIONS, SHOULD THE CONTRACTOR DESIRE TO CONSTRUCT THEM.

31. DEWATERING OPERATIONS ARE EXPECTED THROUGHOUT CONSTRUCTION AND SHALL BE PERFORMED IN ACCORDANCE WITH THE DETAILS.

32. REFER TO ELECTRICAL PLANS FOR ELECTRICAL SYSTEM SPECIFIC DETAILS. ANY CONFLICTS BETWEEN PLAN SETS SHOULD BE RESOLVED BY THE OWNER.

33. THIS PROJECT IS SUBJECT TO THE NEW YORK STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM (SPDES) GENERAL PERMIT FOR CONSTRUCTION ACTIVITIES. ALL CONSTRUCTION SHALL COMPLY TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) STORMWATER MANAGEMENT DESIGN MANUAL.

34. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NYSDEC "STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL". UPON COMPLETION OF THE PROJECT, ALL MATERIALS USED FOR TEMPORARY EROSION CONTROL SHALL BE REMOVED AND BECOME THE PROPERTY OF THE CONTRACTOR.

35. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE THROUGHOUT THE CONSTRUCTION OF THIS PROJECT AND SHALL NOT BLOCK NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES CAUSING RAINWATER TO POND. ALL DRAINAGE PATTERNS MUST BE CONTAINED TO THE EXISTING PARCELS, CONTRACTOR CANNOT SHIFT DRAINAGE PATTERNS ONTO OTHER PARCELS. ALL ROADSIDE DITCHES WITHIN THE CONSTRUCTION LIMITS ARE TO BE CLEANED, HAVE SILT REMOVED AND BE GRADED TO DRAIN AS NEEDED.

36. THE CONTRACTOR SHALL KEEP ALL PERSONNEL AND EQUIPMENT ON THE ROADS DESIGNATED FOR USE DURING CONSTRUCTION SHOWN IN THE TRANSPORTATION ROUTE PLAN. THE CONTRACTOR SHALL FAMILIARIZE THEMSELVES WITH THE POSTING OF ANY ROADS AND/OR BRIDGES OVER WHICH THEY MIGHT BE HAULING MATERIALS.

37. ALL OPEN EXCAVATIONS LEFT OVERNIGHT THROUGHOUT THE PROJECT SHALL BE PROTECTED BY FENCES AND BARRICADES 4 FEET OR TALLER.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) CONSTRUCTION NOTES:

1. PRIOR TO ANY DISTURBANCE, THE CONTRACTOR SHALL ENSURE THAT THE NOTICE OF INTENT (NOI) PREPARED BY THE OWNER HAS BEEN SUBMITTED TO THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION (NYSDEC) AND THAT THE APPROPRIATE LETTER OF ACKNOWLEDGMENT CONTAINING A SPDES PERMIT IDENTIFICATION NUMBER HAS BEEN OBTAINED. COPIES OF ALL DOCUMENTS ARE TO BE MAINTAINED AT THE PROJECT SITE PRIOR TO ANY DISTURBANCE INCLUDING A COPY OF THE SWPPP, THE CONTRACTOR SHALL ENSURE THAT A PRE–CONSTRUCTION MEETING IS HELD TO ESTABLISH AN APPROVED SEQUENCE OF ACTIVITIES IN ACCORDANCE WITH THE SWPPP AND SUPPORTING DOCUMENTATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE IDENTIFIED SEQUENCE OF ACTIVITIES IS FOLLOWED PRECISELY.

2. ALL CONTRACTORS AND SUBCONTRACTORS SHALL CERTIFY THAT THEY UNDERSTAND AND AGREE TO COMPLY WITH THE TERMS AND CONDITIONS OF THE SWPPP PRIOR TO COMMENCEMENT OF ANY DISTURBANCE. THE SWPPP REPORT CONTAINS THE CONTRACTOR AND SUBCONTRACTOR CERTIFICATION FORM THAT SHALL BE USED.

3. STORM WATER DISCHARGES AUTHORIZED BY THE PERMIT SHALL NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF WATER QUALITY STANDARDS INCLUDING BUT NOT LIMITED TO THESE PROVISIONS:

 A. THERE SHALL BE NO INCREASE IN TURBIDITY THAT WILL CAUSE A SUBSTANTIAL VISIBLE CONTRAST TO NATURAL CONDITIONS.

 B. THERE SHALL BE NO SUSPENDED OR SETTLEABLE SOLIDS THAT WILL CAUSE DEPOSITION OR IMPAIR THE RECEIVING WATERS FOR THEIR BEST USES.

 C. THERE SHALL BE NO DISCHARGE OF RESIDUES FROM PETROLEUM PRODUCTS, CHEMICAL PRODUCTS, OR FLOATING SUBSTANCES.

4. THE CONTRACTOR SHALL INSTALL A RAIN GAUGE ON–SITE, ACCURATELY RECORD ITS MEASUREMENT EVERY MORNING DURING CONSTRUCTION AND MAINTAIN A LOG ONSITE.

5. EARTH WORK SHALL BE PERFORMED ONLY WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE EXISTING WEATHER CONDITIONS AND THE WEATHER FORECAST TO DETERMINE IF THE CONDITIONS AT HAND ARE SUITABLE PRIOR TO THE COMMENCEMENT OF WORK EACH DAY. NO EARTHWORK SHALL BE PERMITTED DURING PERIODS OF HEAVY PRECIPITATION.

6. CLEARING AND GRADING SHALL BE PERFORMED TO MINIMIZE DISTURBANCE OF GROUND COVER, ONLY THE SMALLEST AREA THAT IS PRACTICAL SHALL BE DISTURBED AT ANY ONE TIME. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE NYSDEC IF MORE THAN 5 ACRES OF DISTURBANCE AT ANY GIVEN TIME IS REQUIRED.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTROLLING DUST ORIGINATING FROM ITS CONSTRUCTION OPERATIONS TO THE SATISFACTION OF THE OWNER AND SWPPP PROFESSIONAL. THE CONTRACTOR SHALL SUPPLY THE NECESSARY EQUIPMENT AND MATERIALS TO ACCOMPLISH ADEQUATE DUST CONTROL.

8. THESE PLANS, THE SWPPP NOI AND SUPPORTING DOCUMENTS PREPARED BY THE OWNER AND INCORPORATED HEREIN, THE SPDES PERMIT, AND THE "NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL" ARE THE MINIMUM ANTICIPATED EROSION AND SEDIMENT CONTROL MEASURES REQUIRED FOR THE DEVELOPMENT AS PROPOSED. ADDITIONAL MEASURES DEEMED NECESSARY DURING CONSTRUCTION BY THE NYSDEC, MUNICIPALITIES, OR THE QUALIFIED PROFESSIONAL, SHALL BE CONSTRUCTED AND MAINTAINED BY THE CONTRACTOR.

9. IN AREAS WHERE FINAL GRADING CREATES RUN–OFF CONCENTRATIONS THAT RETARD SLOPE STABILIZATION, "JUTE–MESH", SOD, OR ENERGY DISSIPATION, AS APPROVED BY THE QUALIFIED PROFESSIONAL, SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR TO ACHIEVE FINAL STABILIZATION.

10. ALL DISTURBED AREAS SHALL BE STABILIZED WITH EITHER TEMPORARY OR PERMANENT SEED MIXES AND MULCHED, AS SOON AS CONSTRUCTION PRACTICES AND WEATHER PERMITS. DISTURBED AREAS, INCLUDING TOPSOIL STOCKPILES, SHALL NOT REMAIN UNSTABLE FOR MORE THAN 14 CONSECUTIVE DAYS AFTER CONSTRUCTION DISTURBANCE ACTIVITIES IN THE AREA HAVE TEMPORARILY OR PERMANENTLY CEASED.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE STORM WATER CONTROL DEVICES REMAIN IN PLACE AND FUNCTIONAL BY CLEANING, REPAIRING, AND, OR REPLACING THEM WHENEVER NECESSARY OR AS DIRECTED BY THE QUALIFIED PROFESSIONAL, UNTIL FINAL STABILIZATION IS ACHIEVED.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL EROSION AND SEDIMENT CONTROL DEVICES WHEN SPECIFIED BY THE QUALIFIED PROFESSIONAL.

13. FINAL STABILIZATION SHALL MEAN THAT ALL SOIL–DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED, A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 80 PERCENT HAS BEEN ESTABLISHED OR EQUIVALENT STABILIZATION MEASURES HAVE BEEN EMPLOYED ON ALL PERVIOUS AREAS, AND ALL IMPERVIOUS COVERS HAVE BEEN INSTALLED.

14. THE CONTRACTOR SHALL NOTIFY THE OWNER WHEN CONSTRUCTION IS COMPLETE AND WHEN FINAL STABILIZATION OF THE AREAS TO BE DISTURBED IS COMPLETE. UPON RECEIPT OF SUCH NOTIFICATION, THE QUALIFIED PROFESSIONAL SHALL PREPARE A NOTICE OF TERMINATION (NOT), APPROVED BY THE OWNER/OPERATOR, FOR SUBMITTAL TO THE NYSDEC.

N.Y.S.D.O.T. STANDARD GENERAL PLAN NOTES

1. ROAD TO BE KEPT CLEAN OF MUD AND DEBRIS AT ALL TIMES.

2. ROADSIDE DRAINAGE TO BE MAINTAINED AT ALL TIMES.

3. MATERIALS, EQUIPMENT, AND VEHICLES ARE NOT TO BE STORED OR PARKED WITHIN THE NEW YORK STATE RIGHT–OF–WAY.

4. WORK ZONE TRAFFIC CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH THE MOST RECENT NYSDOT STANDARD SPECIFICATIONS – SECTION 619 WORK ZONE TRAFFIC CONTROL, THE NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS 2009 EDITION AND THE NEW YORK STATE SUPPLEMENT.

5. NOTIFY NEW YORK STATE DEPARTMENT OF TRANSPORTATION RESIDENT ENGINEER, ERIC MEKA, ONE (1) WEEK PRIOR TO WORKING IN THE RIGHT–OF–WAY (TELEPHONE NUMBER: (716) 753–2821).

6. NOTIFY DIG SAFELY NEW YORK TWO (2) WORKING DAYS PRIOR TO DIGGING, DRILLING, OR BLASTING AT 1–800–962–7962 FOR UTILITY STAKE–OUT.

7. ALL MATERIALS USED WITHIN THE STATE RIGHT–OF–WAY MUST COMPLY WITH THE LATEST NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND THE CURRENT ADDENDA, ALONG WITH ANY APPROPRIATE CURRENT NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SHEETS.

8. ALL TRAFFIC CONTROL DEVICES MUST CONFORM TO THE NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (NMUTCD) FOR STREETS AND HIGHWAYS AND THE NEW YORK STATE SUPPLEMENT.

NEW YORK STATE DEPARTMENT OF AGRICULTURE AND MARKETS GUIDELINES FOR AGRICULTURAL MITIGATION FOR WIND POWER PROJECTS

THE FOLLOWING GUIDELINES SHALL APPLY TO CONSTRUCTION AREAS FOR WIND POWER CONSTRUCTION PROJECTS IMPACTING AGRICULTURAL LAND. THE PROJECT SPONSOR SHALL COORDINATE WITH THE NEW YORK STATE DEPARTMENT OF AGRICULTURE AND MARKETS (AG. AND MARKETS) TO DEVELOP AN APPROPRIATE SCHEDULE FOR INSPECTIONS TO ASSURE THAT THE GOALS OF THESE GUIDELINES ARE BEING MET. THE PROJECT SPONSOR SHALL HIRE AN ENVIRONMENTAL MONITOR TO OVERSEE THE CONSTRUCTION AND RESTORATION IN AGRICULTURAL FIELDS. THE ENVIRONMENTAL MONITOR SHALL BE ON SITE WHENEVER CONSTRUCTION OR RESTORATION WORK IS OCCURRING ON AGRICULTURAL LAND. THE ENVIRONMENTAL MONITOR SHALL MAINTAIN REGULAR CONTACT WITH THE AFFECTED FARMERS AND AG. AND MARKETS CONCERNING FARM RESOURCES AND MANAGEMENT MATTERS PERTINENT TO THE AGRICULTURAL OPERATIONS AND THE SITE–SPECIFIC IMPLEMENTATION OF THE CONSTRUCTION AND RESTORATION GUIDELINES.

SITING GOALS

MINIMIZE IMPACTS TO NORMAL FARMING OPERATIONS BY LOCATING STRUCTURES ALONG FIELD EDGES AND IN NONAGRICULTURAL AREAS WHERE POSSIBLE. AVOID DIVIDING LARGER FIELDS INTO SMALLER FIELDS, WHICH ARE MORE DIFFICULT TO FARM, BY LOCATING ACCESS ROADS ALONG THE EDGE OF AGRICULTURAL FIELDS (HEDGEROWS AND FIELD BOUNDARIES) AND IN NONAGRICULTURAL AREAS WHERE POSSIBLE. LOCATE ACCESS ROADS, WHICH CROSS AGRICULTURAL FIELDS, ALONG RIDGE TOPS AND FOLLOWING FIELD CONTOURS, WHERE POSSIBLE, TO ELIMINATE THE NEED FOR CUT AND FILL AND REDUCE THE RISK OF CREATING DRAINAGE PROBLEMS. THE PERMANENT WIDTH OF ACCESS ROADS IN AGRICULTURAL FIELDS SHOULD BE NO MORE THAN 16 FEET TO MINIMIZE THE LOSS OF AGRICULTURAL LAND.
ALL EXISTING DRAINAGE AND EROSION CONTROL STRUCTURES SUCH AS DIVERSIONS, DITCHES, AND TILE LINES SHALL BE AVOIDED OR APPROPRIATE MEASURES TAKEN TO MAINTAIN THE DESIGN AND EFFECTIVENESS OF THE EXISTING STRUCTURES. ANY STRUCTURES DISTURBED DURING CONSTRUCTION SHALL BE REPAIRED TO AS CLOSE TO ORIGINAL CONDITION AS POSSIBLE, AS SOON AS POSSIBLE, UNLESS SUCH STRUCTURES ARE TO BE ELIMINATED BASED ON A NEW DESIGN.

CONSTRUCTION REQUIREMENTS

THE SURFACE OF ACCESS ROADS CONSTRUCTED THROUGH AGRICULTURAL FIELDS SHALL BE LEVEL WITH THE ADJACENT FIELD SURFACE. CULVERTS AND WATERBARS SHALL BE INSTALLED TO MAINTAIN NATURAL DRAINAGE PATTERNS. ALL TOPSOIL MUST BE STRIPPED FROM AGRICULTURAL AREAS USED FOR VEHICLE AND EQUIPMENT TRAFFIC AND PARKING. ALL VEHICLE AND EQUIPMENT TRAFFIC AND PARKING SHALL BE LIMITED TO THE ACCESS ROAD AND/OR DESIGNATED WORK AREAS SUCH AS TOWER SITES AND LAYDOWN AREAS. NO VEHICLES OR EQUIPMENT WILL BE ALLOWED OUTSIDE THE WORK AREA WITHOUT PRIOR APPROVAL FROM THE LANDOWNER AND, WHEN APPLICABLE, THE ENVIRONMENTAL MONITOR. THE AREA OF IMPACT FROM THE INSTALLATION OF ELECTRIC CABLES CAN VARY DEPENDING ON THE INSTALLATION METHOD AND NUMBER OF CABLES. WHEN 3 OR MORE CABLES ARE INSTALLED IN THE SAME AREA OR IF AN OPEN TRENCH IS REQUIRED FOR INSTALLATION, TOPSOIL STRIPPING FROM THE ENTIRE WORK AREA WILL BE NECESSARY. AS A RESULT, ADDITIONAL WORK SPACE MAY BE REQUIRED. TOPSOIL STRIPPED FROM WORK AREAS (TOWER SITES, PARKING AREAS, ELECTRIC CABLE TRENCHES, ALONG ACCESS ROADS) SHALL BE STOCKPILED SEPARATE FROM OTHER EXCAVATED MATERIAL (ROCK AND/OR SUBSOIL). AT LEAST 50 FEET OF TEMPORARY WORKSPACE IS NEEDED ALONG "OPEN–CUT" ELECTRIC CABLE TRENCHES FOR PROPER TOPSOIL SEGREGATION. ALL TOPSOIL WILL BE STOCKPILED IMMEDIATELY ADJACENT TO THE AREA WHERE STRIPPED/REMOVED AND SHALL BE USED FOR RESTORATION ON THAT PARTICULAR SITE. TOPSOIL STOCKPILE AREAS SHALL BE CLEARLY DESIGNATED IN THE FIELD AND ON THE ON–SITE "WORKING SET" OF CONSTRUCTION DRAWINGS. ELECTRIC INTERCONNECT CABLES AND TRANSMISSION LINES INSTALLED ABOVE GROUND CAN CREATE LONG TERM INTERFERENCE WITH AGRICULTURAL LAND USE. AS A RESULT, INTERCONNECT CABLES SHALL BE BURIED IN AGRICULTURAL FIELDS WHEREVER PRACTICABLE. INTERCONNECT CABLES AND TRANSMISSION LINES INSTALLED ABOVE GROUND SHOULD BE LOCATED OUTSIDE FIELD BOUNDARIES WHEREVER POSSIBLE. WHEN ABOVE GROUND CABLES AND TRANSMISSION LINES MUST CROSS FARMLAND, THE PROJECT SPONSOR SHALL MINIMIZE AGRICULTURAL IMPACTS BY USING TALLER STRUCTURES THAT PROVIDE LONGER SPANNING DISTANCES AND SHALL LOCATE POLES ON FIELD EDGES TO THE GREATEST EXTENT PRACTICABLE. THE LINE LOCATION AND POLE PLACEMENTS SHALL BE REVIEWED WITH THE DEPARTMENT AND THE ENVIRONMENTAL MONITOR PRIOR TO FINAL DESIGN. IN CROPLAND, HAYLAND AND IMPROVED PASTURE A MINIMUM DEPTH OF FORTY–EIGHT INCHES OF COVER WILL BE REQUIRED FOR ALL BURIED ELECTRIC CABLES. IN UNIMPROVED GRAZING AREAS AND LAND PERMANENTLY DEVOTED TO PASTURE, A MINIMUM DEPTH OF THIRTY–SIX INCHES OF COVER WILL BE REQUIRED. IN AREAS WHERE THE DEPTH OF SOIL OVER BEDROCK RANGES FROM ZERO TO FORTY–EIGHT INCHES, THE ELECTRIC CABLES SHALL BE BURIED ENTIRELY BELOW THE TOP OF THE BEDROCK OR AT THE DEPTH SPECIFIED FOR THE PARTICULAR LAND USE WHICHEVER IS LESS. AT NO TIME WILL THE DEPTH OF COVER BE LESS THAN TWENTY–FOUR INCHES BELOW THE SOIL SURFACE. FOR LANDS DISTURBED WITHIN OR ADJOINED TO AGRICULTURAL AREAS WHERE THE INSTALLATION OF THE BURIED ELECTRIC CABLES ALTERS THE NATURAL STRATIFICATION OF SOIL HORIZONS AND NATURAL SOIL DRAINAGE PATTERNS, THE PROJECT SPONSOR SHALL RECTIFY THE EFFECTS WITH MEASURES SUCH AS SUBSURFACE INTERCEPT DRAIN LINES. THE ENVIRONMENTAL MONITOR, IN CONSULTATION WITH AG. AND MARKETS STAFF, SHALL SELECT THE TYPE OF INTERCEPT DRAIN LINES TO INSTALL TO PREVENT SURFACE SEEPS AND THE SEASONALLY PROLONGED SATURATION OF THE CABLE INSTALLATION ZONE AND ADJACENT AREAS. DRAWINGS OF SUCH DRAIN LOCATIONS SHALL BE PROVIDED BY THE PROJECT SPONSOR DURING MONITORING AND FOLLOW–UP REMEDIATION. ALL DRAIN LINES SHALL BE INSTALLED ACCORDING TO NATURAL RESOURCE CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS AND SHALL MEET OR EXCEED THE AASHTO M252 SPECIFICATIONS. ALL EXCESS SUBSOIL AND ROCK SHALL BE REMOVED FROM THE SITE. ON SITE DISPOSAL OF SUCH MATERIAL MAY BE ALLOWED IF APPROVED BY THE LANDOWNER AND THE ENVIRONMENTAL MONITOR, WITH APPROPRIATE CONSIDERATION GIVEN TO ANY POSSIBLE AGRICULTURAL OR ENVIRONMENTAL IMPACTS.* IN PASTURE AREAS, WORK AREAS WILL BE FENCED TO PREVENT LIVESTOCK ACCESS, CONSISTENT WITH LANDOWNER AGREEMENTS. ALL PIECES OF WIRE, BOLTS, AND OTHER UNUSED METAL OBJECTS WILL BE PICKED UP AND PROPERLY DISPOSED OF AS SOON AS PRACTICAL AFTER THE UNLOADING AND PACKING OF TURBINE COMPONENTS SO THAT THESE OBJECTS WILL NOT BE MIXED WITH ANY TOPSOIL.* EXCESS CONCRETE WILL NOT BE BURIED OR LEFT ON THE SURFACE IN ACTIVE AGRICULTURAL AREAS. CONCRETE TRUCKS WILL BE WASHED OUTSIDE OF ACTIVE AGRICULTURAL AREAS.*
(*ANY PERMITS NECESSARY FOR DISPOSAL UNDER LOCAL, STATE AND/OR FEDERAL LAWS AND REGULATIONS MUST BE OBTAINED BY THE CONTRACTOR, WITH THE COOPERATION OF THE LANDOWNER WHEN REQUIRED.)

RESTORATION REQUIREMENTS

FOLLOWING CONSTRUCTION, ALL DISTURBED AGRICULTURAL AREAS WILL BE DECOMPACTED TO A DEPTH OF 18 INCHES WITH A DEEP RIPPER OR HEAVY–DUTY CHISEL PLOW. SOIL COMPACTION RESULTS SHALL BE NO MORE THAN 250 POUNDS PER SQUARE INCH (PSI) AS MEASURED WITH A SOIL PENETROMETER. IN AREAS WHERE THE TOPSOIL WAS STRIPPED, SOIL DECOMPACTION SHALL BE CONDUCTED PRIOR TO TOPSOIL REPLACEMENT. FOLLOWING DECOMPACTION, ALL ROCKS 4 INCHES AND LARGER IN SIZE WILL BE REMOVED FROM THE SURFACE OF THE SUBSOIL PRIOR TO REPLACEMENT OF THE TOPSOIL. THE TOPSOIL WILL BE REPLACED TO ORIGINAL DEPTH AND THE ORIGINAL CONTOURS WILL BE REESTABLISHED WHERE POSSIBLE. ALL ROCKS 4 INCHES AND LARGER SHALL BE REMOVED FROM THE SURFACE OF THE TOPSOIL. SUBSOIL DECOMPACTION AND TOPSOIL REPLACEMENT SHOULD BE AVOIDED AFTER OCTOBER 1, UNLESS APPROVED ON A SITE–SPECIFIC BASIS BY THE LANDOWNER IN CONSULTATION WITH AG. AND MARKETS. ALL PARTIES INVOLVED SHOULD BE COGNIZANT THAT AREAS RESTORED AFTER OCTOBER 1ST MAY NOT OBTAIN SUFFICIENT GROWTH TO PREVENT EROSION OVER THE WINTER MONTHS. IF AREAS ARE TO BE RESTORED AFTER OCTOBER 1ST , NECESSARY PROVISION SHOULD BE MADE TO RESTORE ANY ERODED AREAS IN THE SPRINGTIME, TO ESTABLISH PROPER GROWTH. ALL ACCESS ROADS WILL BE REGRADED TO ALLOW FOR FARM EQUIPMENT CROSSING AND TO RESTORE ORIGINAL SURFACE DRAINAGE PATTERNS, OR OTHER DRAINAGE PATTERN INCORPORATED INTO THE DESIGN. ALL RESTORED AGRICULTURAL AREAS SHALL BE SEEDED WITH THE SEED MIX SPECIFIED BY THE LANDOWNER, IN ORDER TO MAINTAIN CONSISTENCY WITH THE SURROUNDING AREAS.
ALL SURFACE OR SUBSURFACE DRAINAGE STRUCTURES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO AS CLOSE TO PRECONSTRUCTION CONDITIONS AS POSSIBLE, UNLESS SAID STRUCTURES ARE TO BE REMOVED AS PART OF THE PROJECT DESIGN. ANY SURFACE OR SUBSURFACE DRAINAGE PROBLEMS RESULTING FROM CONSTRUCTION OF THE WIND ENERGY PROJECT WILL BE CORRECTED WITH THE APPROPRIATE MITIGATION AS DETERMINED BY THE ENVIRONMENTAL MONITOR, THE DEPARTMENT AND THE LANDOWNER. ON AFFECTED FARMLAND, ANY RESTORATION PRACTICES SHALL BE POSTPONED UNTIL FAVORABLE (WORKABLE, RELATIVELY DRY) TOPSOIL/SUBSOIL CONDITIONS EXIST. RESTORATION SHALL NOT BE CONDUCTED WHILE SOILS ARE IN A WET OR PLASTIC STATE. STOCKPILED TOPSOIL SHALL NOT BE REGRADED AND SUBSOIL SHALL NOT BE DECOMPACTED UNTIL PLASTICITY, AS DETERMINED BY THE ATTERBERG FIELD TEST IS SIGNIFICANTLY REDUCED. NO PROJECT RESTORATION ACTIVITIES SHALL OCCUR IN AGRICULTURAL FIELDS BETWEEN THE MONTHS OF OCTOBER THROUGH MAY UNLESS FAVORABLE SOIL MOISTURE CONDITIONS EXIST. THE ENVIRONMENTAL MONITOR SHALL ADVISE AG & MARKETS REGARDING TENTATIVE RESTORATION PLANNING. POTENTIAL SCHEDULES WILL BE DETERMINED BY CONDUCTING THE ATTERBERG FIELD TEST AT APPROPRIATE DEPTHS INTO TOPSOIL STOCKPILES, AND BELOW THE SUBSOIL SURFACE FOR A MUTUAL DETERMINATION OF ADEQUATE FIELD CONDITIONS FOR THE RESTORATION PHASE OF THE PROJECT. FOLLOWING RESTORATION, ALL CONSTRUCTION DEBRIS WILL BE REMOVED FROM THE SITE.

TWO YEAR MONITORING AND REMEDIATION

THE PROJECT SPONSOR WILL PROVIDE A MONITORING AND REMEDIATION PERIOD OF NO LESS THAN TWO YEARS IMMEDIATELY FOLLOWING THE COMPLETION OF INITIAL RESTORATION. THE TWO YEAR PERIOD ALLOWS FOR THE EFFECTS OF CLIMATIC CYCLES SUCH AS FROST ACTION, PRECIPITATION AND GROWING SEASONS TO OCCUR, FROM WHICH VARIOUS MONITORING DETERMINATIONS CAN BE MADE. THE MONITORING AND REMEDIATION PHASE WILL BE USED TO IDENTIFY ANY REMAINING AGRICULTURAL IMPACTS ASSOCIATED WITH CONSTRUCTION THAT ARE IN NEED OF MITIGATION AND TO IMPLEMENT THE FOLLOW–UP RESTORATION. GENERAL CONDITIONS TO BE MONITORED INCLUDE TOPSOIL THICKNESS, RELATIVE CONTENT OF ROCK AND LARGE STONES, TRENCH SETTLING, CROP PRODUCTION, DRAINAGE AND REPAIR OF SEVERED FENCES, ETC. IMPACTS WILL BE IDENTIFIED BY THE ENVIRONMENTAL MONITOR THROUGH ON SITE MONITORING OF ALL AGRICULTURAL AREAS IMPACTED BY CONSTRUCTION AND THROUGH CONTACT WITH RESPECTIVE FARMLAND OPERATORS AND THE DEPARTMENT OF AGRICULTURE AND MARKETS. TOPSOIL DEFICIENCY AND TRENCH SETTLING SHALL BE MITIGATED WITH IMPORTED TOPSOIL THAT IS CONSISTENT WITH THE QUALITY OF TOPSOIL ON THE AFFECTED SITE. EXCESSIVE AMOUNTS OF ROCK AND OVERSIZED STONE MATERIAL WILL BE DETERMINED BY A VISUAL INSPECTION OF DISTURBED AREAS AS COMPARED TO PORTIONS OF THE SAME FIELD LOCATED OUTSIDE THE CONSTRUCTION AREA. ALL EXCESS ROCKS AND LARGE STONES WILL BE REMOVED AND DISPOSED OF BY THE PROJECT SPONSOR. WHEN THE SUBSEQUENT CROP PRODUCTIVITY WITHIN AFFECTED AREAS IS LESS THAN THAT OF THE ADJACENT UNAFFECTED AGRICULTURAL LAND, THE PROJECT SPONSOR AS WELL AS OTHER APPROPRIATE PARTIES, WILL HELP TO DETERMINE THE APPROPRIATE REHABILITATION MEASURES TO BE IMPLEMENTED. BECAUSE CONDITIONS WHICH REQUIRE REMEDIATION MAY NOT BE NOTICEABLE AT OR SHORTLY AFTER THE COMPLETION OF CONSTRUCTION, THE SIGNING OF A RELEASE FORM PRIOR TO THE END OF THE REMEDIATION PERIOD WILL NOT OBVIATE THE PROJECT SPONSOR'S RESPONSIBILITY TO FULLY REDRESS ALL PROJECT IMPACTS. SUBSOIL COMPACTION SHALL BE TESTED USING AN APPROPRIATE SOIL PENETROMETER OR OTHER SOIL COMPACTION MEASURING DEVICE. COMPACTION TESTS WILL BE MADE FOR EACH SOIL TYPE IDENTIFIED ON THE AFFECTED AGRICULTURAL FIELDS. THE SUBSOIL COMPACTION TEST RESULTS WITHIN THE AFFECTED AREA WILL BE COMPARED WITH THOSE OF THE ADJACENT UNAFFECTED PORTION OF THE FARM FIELD/SOIL UNIT. WHERE REPRESENTATIVE SUBSOIL DENSITY OF THE AFFECTED AREA EXCEEDS THE REPRESENTATIVE SUBSOIL DENSITY OF THE UNAFFECTED AREAS, ADDITIONAL SHATTERING OF THE SOIL PROFILE WILL BE PERFORMED USING THE APPROPRIATE EQUIPMENT. DEEP SHATTERING WILL BE APPLIED DURING PERIODS OF RELATIVELY LOW SOIL MOISTURE TO ENSURE THE DESIRED MITIGATION AND TO PREVENT ADDITIONAL SUBSOIL COMPACTION. OVERSIZED STONE/ROCK MATERIAL WHICH IS UPLIFTED TO THE SURFACE AS A RESULT OF THE DEEP SHATTERING WILL BE REMOVED.

LEGEND

EXISTING

- BRIDGE
- 400 — CONTOUR, MAJOR
- 401 — CONTOUR, MINOR
- DT — COUNTY DRAIN TILES
- OH E — ELECTRIC LINE, OVERHEAD
- UG E — ELECTRIC LINE, UNDERGROUND
- X — FENCE LINE
- FLOOD PLAIN
- MICROWAVE — FREZNEL ZONE
- G — GAS, UNDERGROUND
- UP/L — POLE, WITH LIGHT
- UP NM 45 — POLE, WITH UTILITY
- PROPERTY LINE (APPROX.)
- PROPERTY LINE (SURVEYED)
- RIGHT OF WAY LINE
- SETBACK LINE
- SIGN — SIGN
- X 401.23 — SPOT ELEVATION
- STREAM, APPROX.
- STREAM, NWI MAPPED
- 6" PINE — TREE, CONIFEROUS
- 6" MAPLE — TREE, DECIDUOUS
- BRUSH LINE
- TREE LINE
- SNOWMBLE TRL — SNOWMOBILE TRAIL
- HVB HOWLAND VERY STONY LOAM HSG: D — SOIL BOUNDARY & TYPE

PROPOSED

- 500 — CONTOUR, MAJOR
- 501 — CONTOUR, MINOR
- UG E — CIR1 — UNDERGROUND ELECTRIC COLLECTION (WITH CIRCUIT DESIGNATION)
- OH E — OVERHEAD ELECTRIC TRANSMISSION
- NEW ACCESS ROAD
- LIMIT OF DISTURBANCE
- CE — CONSTRUCTION EASEMENT
- CRANE WALK PATH
- TEMPORARY IMPROVEMENT
- E & S, CHECK DAM
- E & S, CONSTRUCTION ENTRANCE
- E & S, RIP–RAP OUTLET PROTECTION
- E & S, SILT FENCE
- VEGETATED FILTER STRIP
- FORESTED FILTER STRIP
- TREE CLEARING LIMITS
- FLOW DIRECTIONAL ARROW
- EXISTING UTILITY CROSSING LOCATION
- CULVERT (H1)–1, ACCESS ROAD ABBREVIATION — PROPOSED PERMANENT CULVERT LABEL

REV	DESCRIPTION	DATE	BY
7			
6			
5			
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2			
1			

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FA PROJECT NO. 150001
PROJECT MANAGER P. McCARTHY
DRAWN BY VT, TK
SCALE AS SHOWN
ISSUE DATE OCT. 2016

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
GENERAL NOTES AND LEGEND

DRAWING NO.
GN-1

FILE NAME: H:\Projects\150001–Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 GN–1 general notes and legend.dwg
DATE/TIME: 10/14/2016 10:07:01 AM
USER: Steven Mellott

ROAD DESIGN PARAMETERS

1. THE ROAD SECTION HAS BEEN DESIGNED TO ACCOMMODATE WIND TURBINE COMPONENT DELIVERY DURING CONSTRUCTION AND LIGHT DUTY TRUCKS FOR LOW VOLUME USE IN NORMAL OPERATING CONDITIONS. THE ROAD DESIGN SPECIFIED IS NOT INTENDED FOR ALL WEATHER USE FOR HEAVY DUTY, HIGH VOLUME, CONSTRUCTION LOADS.
2. ROAD MAINTENANCE CAN BE EXPECTED OVER THE LIFE OF THE PERMANENT FACILITY AND MAY INCLUDE BLADING AND REPLACEMENT OF AGGREGATE MATERIAL.
3. CONTRACTOR SHALL CONFIRM ROAD SECTIONS REQUIRED FOR TURBINE COMPONENT DELIVERY WITH THE GEOTECHNICAL REPORT.
4. CONTRACTOR SHALL CONFIRM ROAD DESIGN MEETS THE REQUIREMENTS OF THE TURBINE MANUFACTURER ACCESS ROAD MANUAL.

PRODUCTS

1. TURBINE ACCESS ROAD BASE AND POST CONSTRUCTION CAP SHALL CONSIST OF NYSDOT 733–04 TYPE 2 COARSE AGGREGATE MEETING THE GRADATION PROVIDED IN TABLE 1.
2. LAYDOWN YARD AGGREGATE BASE SHALL CONSIST OF NYSDOT 733–04 TYPE 2 COARSE AGGREGATE MEETING THE GRADATION PROVIDED IN TABLE 1.
3. ROAD SUBGRADE, SHOULDERS, AND CRANE PADS SHALL CONSIST OF COMPACTED NATIVE SOILS.
4. IF REQUIRED, GEOTEXTILE FABRIC FOR AGGREGATE BASE MATERIAL SEPARATION SHALL BE MIRAFI HP–570 OR APPROVED EQUAL AND/OR TENSAR BX1200 GEOGRID OR APPROVED EQUAL.
5. CULVERTS: SEE PLAN FOR CULVERT LOCATIONS. CULVERTS SHALL BE A MINIMUM 16 GA. CORRUGATED METAL PIPE AND MEET THE MINIMUM SPECIFICATIONS SET FORTH BY THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION AND/OR CHAUTAUQUA COUNTY.

EXECUTION

1. CLEARING AND GRUBBING
   A. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNER'S REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
2. TOPSOIL STRIPPING
   A. TOPSOIL SHALL BE STRIPPED FROM ALL ROADWAY AREAS THROUGH THE ROOT ZONE. TOPSOIL SHALL NOT BE STRIPPED OUTSIDE OF THE DESIGNATED DISTURBANCE AREAS.
   B. ANY TOPSOIL, THAT HAS BEEN STRIPPED, SHALL BE RE–SPREAD OR STOCKPILED WITHIN GRADING AREAS AND/OR USED AS FILL OUTSIDE OF THE DISTURBANCE AREAS, AS DIRECTED BY THE ENGINEER. ALL TOPSOIL SHALL BE REDISTRIBUTED TO THE LAND OWNER'S PROPERTY OF WHERE IT ORIGINATED FROM.
3. EMBANKMENT CONSTRUCTION
   A. REFER TO NYSDOT STANDARD SPECIFICATION 733–08 FOR EMBANKMENT SPECIFICATION.
   B. EMBANKMENT CONSTRUCTION SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL, AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, EMBANKMENTS SHALL HAVE COMPACTED SUPPORT SLOPES OF ONE FOOT HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR EMBANKMENT CONSTRUCTION SHALL BE OBTAINED FROM THE ACCESS ROAD EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED OFFSITE BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 8" FOR COHESIVE SOILS OR 12" FOR GRANULAR SOILS.
   C. SIDE SLOPES GREATER THAT 4:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
4. STRUCTURAL SUBGRADE SHOULD BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM STANDARD PROCTOR DRY DENSITY.

STORMWATER DESIGN PARAMETERS

1. ANTICIPATED DRAINAGE CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLANS BASED LARGELY ON OBSERVATION OF DRAINAGE CHANNELS/DRAINAGE EROSION FROM THE AERIAL IMAGERY, SUPPLEMENTED BY GIS STREAM LINEWORK AND EXISTING CONTOUR DATA AVAILABLE. ADDITIONAL CROSSINGS (LOW WATER CROSSINGS/CULVERTS) MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
2. CULVERT SHALL BE SIZED TO A MINIMUM 25–YEAR RECURRENCE PERIOD, 24 HOUR EVENT, CULVERTS SHALL BE MINIMUM 12" CORRUGATED METAL PIPE. ACTUAL SIZE WILL BE DETERMINED BY HYDRAULIC ANALYSIS. ALL TEMPORARY PORTIONS OF THE INSTALLED CULVERTS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
3. IT IS EXPECTED THAT CULVERTS WILL BE OVERTOPPED DURING SOME STORMS AND MAINTENANCE WILL BE REQUIRED THROUGH THE LIFE OF THE PROJECT.
4. THE LOW WATER CROSSING DESIGNED TO BE OVERTOPPED SHOULD HAVE AN ADEQUATE CAPACITY TO PASS THE 25–YEAR STORM FLOW PLUS THE DEBRIS AND SEDIMENT CARRIED DURING THE STORM.
5. WHEN INSTALLING DRAINAGE CULVERTS THE CONTRACTOR SHALL USE JUDGMENT IN SETTING THE FLOW LINE ELEVATIONS AND CULVERT LONGITUDINAL SLOPE. TYPICALLY THE FLOW LINE ELEVATIONS AND LONGITUDINAL SLOPE OF THE CULVERT SHOULD MATCH THE NATURAL GROUND ELEVATIONS AND SLOPE TO ENSURE POSITIVE DRAINAGE. WHEN POSSIBLE, ALL CULVERTS SHOULD BE PLACED AT A MINIMUM 0.5% GRADE.
6. ANTICIPATED CULVERT CROSSINGS ARE SHOWN ON THE CONSTRUCTION PLAN, ADDITIONAL CULVERTS MAY NEED TO BE INSTALLED IN AREAS WHERE CONCENTRATED FLOW IS EXPECTED DUE TO CONSTRUCTION ACTIVITIES.
7. CONSTRUCTION DRAINAGE CROSSINGS TO MAINTAIN EXISTING FLOW CHARACTERISTICS OF THE FEATURES. FEATURES SHALL BE GRADED TO PRECONSTRUCTION CONTOURS.
8. ALL CULVERTS SHALL BE A MINIMUM 16 GA. CORRUGATED METAL PIPE.

TABLE 1: NYSDOT 733-04 TYPE 2 AGGREGATE GRADATION

Sieve Size Designation	Percent Passing by Weight
	Type 2
4 in.	-
3 in.	-
2 in.	100
1/4 in.	25-60
No. 40	5-40
No. 200	0-10

TESTING

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY.
2. SUBMIT ONE SET OF TESTING AND INSPECTION RECORDS SPECIFIED TO THE CIVIL ENGINEER OF RECORD.
3. CONTRACTOR SHALL MAINTAIN A TESTING LOG TO ENSURE THAT TESTING IS PERFORMED AND RESULTS ARE ACCEPTABLE.

DEFINITIONS

1. PROOF ROLLING:
   SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT RECOMMENDATIONS AND IN THE PRESENCE OF THE GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK OR WATER TRUCK WITH A MAXIMUM GROSS WEIGHT OF 25 TONS OR A FULLY LOADED BELLY DUMP WITH AN EQUIVALENT AXLE LOADING. PROOF–ROLLING ACCEPTANCE STANDARDS INCLUDE NO RUTTING GREATER THAN 1.5 INCHES, AND NO "PUMPING" OF THE SOIL BEHIND THE LOADED TRUCK.
2. SIEVE ANALYSIS:
   SHALL BE CONDUCTED IN ACCORDANCE WITH AASHTO T27
3. PROCTORS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T99
4. ATTERBERG LIMITS:
   SHALL BE DETERMINED IN ACCORDANCE WITH AASHTO T89 AND T90
5. MOISTURE DENSITY (NUCLEAR DENSITY):
   SHALL BE DONE IN ACCORDANCE WITH AASHTO T310
6. DYNAMIC CONE PENETROMETER (DCP) TESTING:
   SHALL BE DONE IN ACCORDANCE WITH ASTM D6951–03

REQUIREMENTS (NON–CEMENT STABILIZED ROADWAYS)

1. FILL MATERIAL:
   A. SOILS USED AS FILL MATERIAL SHALL BE TESTED FOR GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, PROCTOR TESTS AND IN ACCORDANCE WITH NYSDOT AND GEOTECHNICAL REPORT RECOMMENDATIONS.
   B. IN ROADWAY CUT AREAS, OR WHERE EMBANKMENT CONSTRUCTION REQUIRES LESS THAN 12 INCHES OF FILL PLACEMENT, COMPACT TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY. THE SCARIFICATION DEPTH SHALL BE ADJUSTED SUCH THAT THE COMBINED THICKNESS OF THE EMBANKMENT FILL MATERIAL AND SCARIFICATION DEPTH SHALL BE 12 INCHES OR GREATER.
   C. MAXIMUM LIQUID LIMIT = 45
   D. MAXIMUM PLASTIC INDEX = 15
2. COMPACTED SUBGRADE:
   A. THE ENTIRE SUBGRADE SHALL BE PROOF–ROLLED PRIOR TO THE PLACEMENT OF THE AGGREGATE BASE TO IDENTIFY AREAS OF UNSTABLE SUBGRADE.
   B. IF PROOF ROLLING DETERMINES THAT THE SUBGRADE STABILIZATION CANNOT BE ACHIEVED, PERFORM 3 DYNAMIC CONE PENETROMETER (DCP) TESTS PER ACCESS ROAD SPUR, OR ONE FOR EVERY 1,000 L.F. OF ROAD, WHICHEVER IS GREATER AND CONSULT WITH THE GEOTECHNICAL ENGINEER TO DETERMINE WHICH OF THE FOLLOWING ALTERNATIVES WILL BE IMPLEMENTED:
      a. SCARIFY, DRY, AND RECOMPACT SUBGRADE AND PERFORM ADDITIONAL PROOF ROLL.
      b. REMOVE UNSUITABLE MATERIAL AND REPLACE WITH 3 INCH MINUS CRUSHED AGGREGATE BASE.
      c. INCREASE ROAD BASE THICKNESS.
      d. USE A MIRAFI HP–570 GEOTEXTILE FABRIC OR APPROVED EQUAL AND/OR TENSAR BX1200 OR APPROVED EQUAL AND CHANGE THE AGGREGATE BASE TO 3 INCH MINUS MATERIAL.
   C. PROVIDE 3 MOISTURE DENSITY COMPACTION TESTS PER ACCESS ROAD SPUR, OR ONE FOR EVERY 1000 L.F. OF ROAD LENGTH, WHICHEVER IS GREATER. COMPACTED SUBGRADE MUST BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR MAXIMUM DRY DENSITY AT ±3% OF OPTIMUM MOISTURE CONTENT FOR GRANULAR SOILS AND AT –1 TO 2% OF OPTIMUM MOISTURE CONTENT FOR COHESIVE SOILS.
3. AGGREGATE BASE:
   A. AGGREGATE BASE SHALL BE PROOF–ROLLED OVER THE ENTIRE LENGTH. IF PROOF ROLLING DETERMINES THAT THE ROAD IS UNSTABLE, ADDITIONAL AGGREGATE SHALL BE ADDED UNTIL THE UNSTABLE SECTION IS ABLE TO PASS A PROOF ROLL.
   B. PROVIDE 1 DCP TEST FOR EVERY 1,000 L.F. OF ROAD LENGTH. ROAD BASE SHALL BE COMPACTED TO ACHIEVE A PENETRATION INDEX VALUE LESS THAN OR EQUAL TO 10 MM/BLOW OR EQUIVALENT TO A CBR VALUE GREATER THAN OR EQUAL TO 25 (WHICHEVER IS GREATER).
   C. PROVIDE 1 SIEVE ANALYSIS (PROJECT MAX OF 20) PER 2500 CY OF ROAD BASE PLACED.
   D. MAXIMUM LIQUID LIMIT = 45
   E. MAXIMUM PLASTIC INDEX = 15
4. CRANE PADS
   A. MOISTURE DENSITY TESTING SHALL BE PERFORMED AT A MINIMUM OF 2 PER CRANE PAD. CRANE PADS MUST BE COMPACTED TO A MINIMUM OF 98% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AT ±3% OF OPTIMUM MOISTURE CONTENT FOR GRANULAR SOILS AND AT –1 TO +2% OF OPTIMUM MOISTURE CONTENT FOR COHESIVE SOILS.
   B. ALL CRANE PADS MUST BE PROOF ROLLED PRIOR TO UTILIZATION.
   C. IF THE CRANE PAD CANNOT ACHIEVE PROOF–ROLL ACCEPTANCE AS DETERMINED BY THE GEOTECHNICAL ENGINEER, DCP TEST MAY BE USED. WHEN UTILIZED, DCP TESTING SHALL BE USED AT MINIMUM RATE OF 2 PER CRANE PAD AND ACHIEVE A MAXIMUM OF 24 MM/BLOW.
   D. AT THE CONTRACTOR'S DISCRETION, CRANE MATS MAY BE UTILIZED TO PROVIDE ADDITIONAL STABILITY.
5. CRANE PATHS/CRANE TRAVEL SHOULDERS
   A. CRANE PATHS AND CRANE TRAVEL SHOULDERS SHALL BE PROOF–ROLLED OVER THE ENTIRE LENGTH.
   B. WHERE REQUIRED TO SUPPORT CRANE TRAVEL, SCARIFY AND COMPACT EXISTING SOILS TO A DEPTH OF 6–INCHES AND TO A MINIMUM OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AT ±3% OF OPTIMUM MOISTURE CONTENT FOR GRANULAR SOILS AND AT –1 TO +2% OF OPTIMUM MOISTURE CONTENT FOR COHESIVE SOILS.

TABLE 2: TESTING SCHEUDLE SUMMARY

LOCATION	TEST	FREQUENCY
STRUCTURAL FILL	GRAIN SIZE ANALYSIS, MOISTURE CONTENT, ATTERBERG LIMITS ON FINES CONTENT, AND PROCTOR	1 PER MAJOR SOIL TYPE
COMPACTED SUBGRADE	PROOF-ROLL	ENTIRE LENGTH
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	1 PER 1000 FT OR MIN. 3 PER ROAD
	DCP (NOT REQUIRED UNLESS PROOF ROLL FAILS)	1 PER 1000 FT
AGGREGATE BASE	PROOF-ROLL	ENTIRE AREA
	SIEVE ANALYSIS, LL, PL, AND LA ABRASION	1 PER 2,500 CY
	DCP TEST	1 PER 1000 LF OF ROAD
CRANE PAD COMPACTED SUBGRADE	PROOF-ROLL	ENTIRE AREA
	MOISTURE DENSITY TEST (NUCLEAR DENSITY)	2 PER PAD
	DCP (NOT REQUIRED UNLESS PROOF ROLL FAILS)	2 PER PAD
CRANE SHOULDERS	PROOF-ROLL	ENTIRE LENGTH

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TITLE OF DRAWING
GENERAL NOTES

DRAWING NO.
GN-2

CHAUTAUQUA COUNTY

TOWN OF HANOVER

TOWN OF VILLENOVA

TOWN OF ARKWRIGHT

NYS ROUTE 39

BRADIGAN ROAD

COUNTY TOURING RTE 87

EMPIRE ROAD

CAMPBELL ROAD

SUBSTATION

LAYDOWN AREA

HANOVER ROAD

SOUTH DAYTON SILVER CREEK ROAD

HURLBERT ROAD

DYE ROAD

E LAKE ROAD

WANGO ROAD

COUNTY TOURING RTE 93

FLICKER HILL ROAD

STAFFORD ROAD

ZAHM ROAD

ROUND TOP ROAD

POPE HILL ROAD

HENRY ROAD

PUTNAM ROAD

SHAW ROAD

BARTLETT HILL ROAD

O&M BUILDING

PROSPECT ROAD

NORTH HILL ROAD

BALL HILL ROAD

N HILL ROAD

SMITH ROAD

NYS ROUTE 83

VILLENOVA ROAD

CEMETERY ROAD

DANKER ROAD

HOOKER ROAD

BALCOM CROSS ROAD

R-1 R-2 R-3 R-4 R-5 R-6 R-7 R-8 R-9 R-10

2 3 4 5 6 7 8 9 11 13 14 15 16 17 18 19 20 21 23 27 28 30 31 33 34 35 36 37 39

LEGEND

TURBINE COMPONENT DELIVERY ROUTE

R-1 INTERSECTION IMPROVEMENT SHEETS

1500 0 1500 3000 4500 FEET

Scale: 1"=1500'

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 TP-1 transportation route index.dwg
DATE/TIME: 10/14/2016 10:07:58 AM
USER: Steven Mellott

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TITLE OF DRAWING
TRANSPORTATION ROUTE PLAN

DRAWING NO.
TP-1

SHEET 5 OF 81

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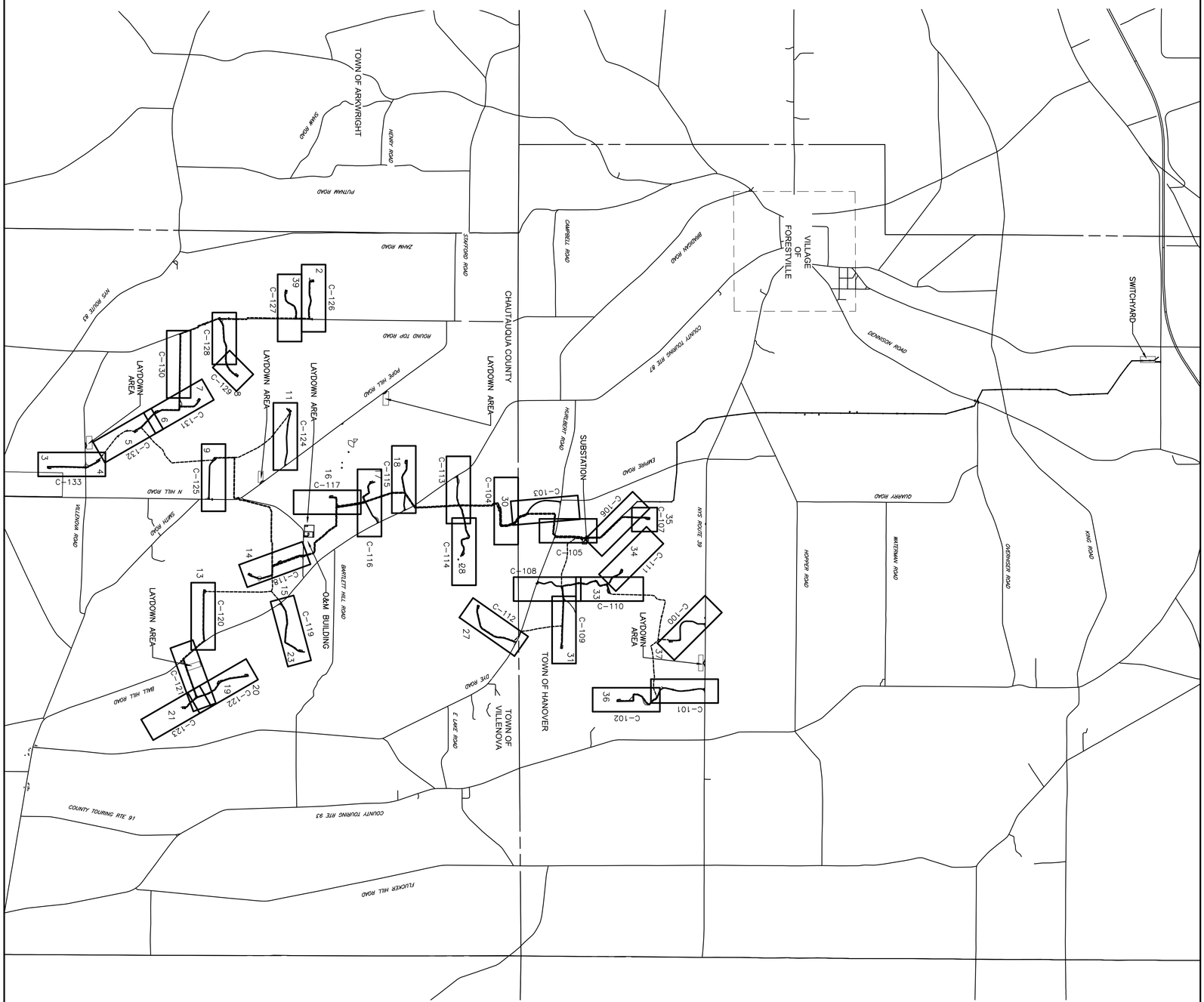

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TITLE OF DRAWING
PLAN INDEX

DRAWING NO.
IND-C

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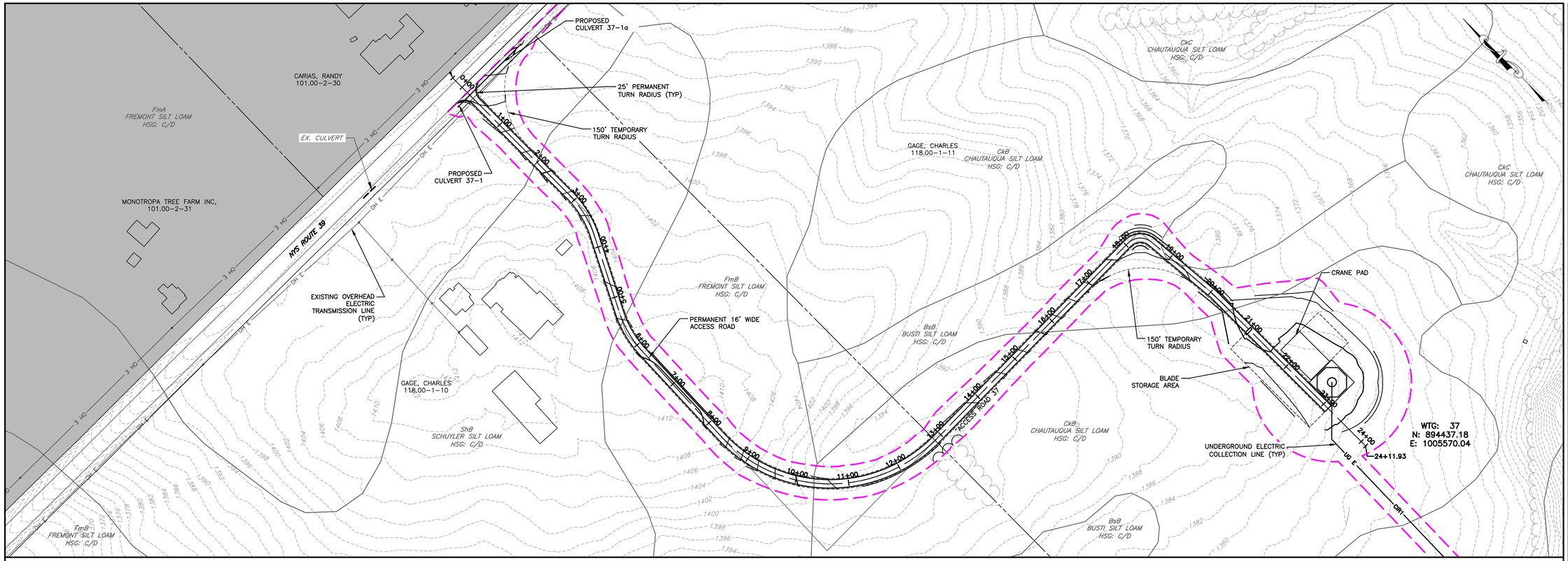

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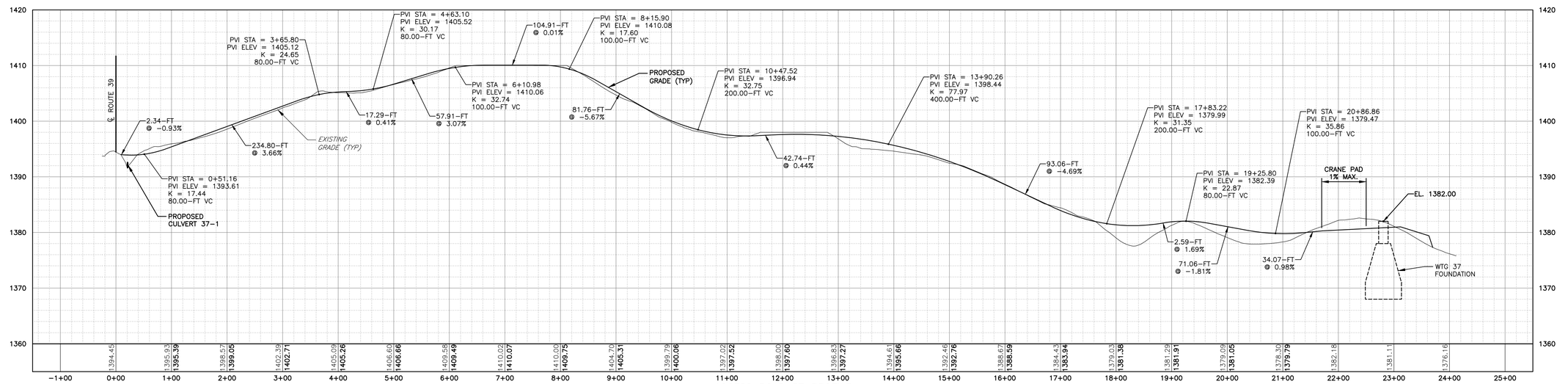

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WTG 37 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-100
SHEET 7 OF 81

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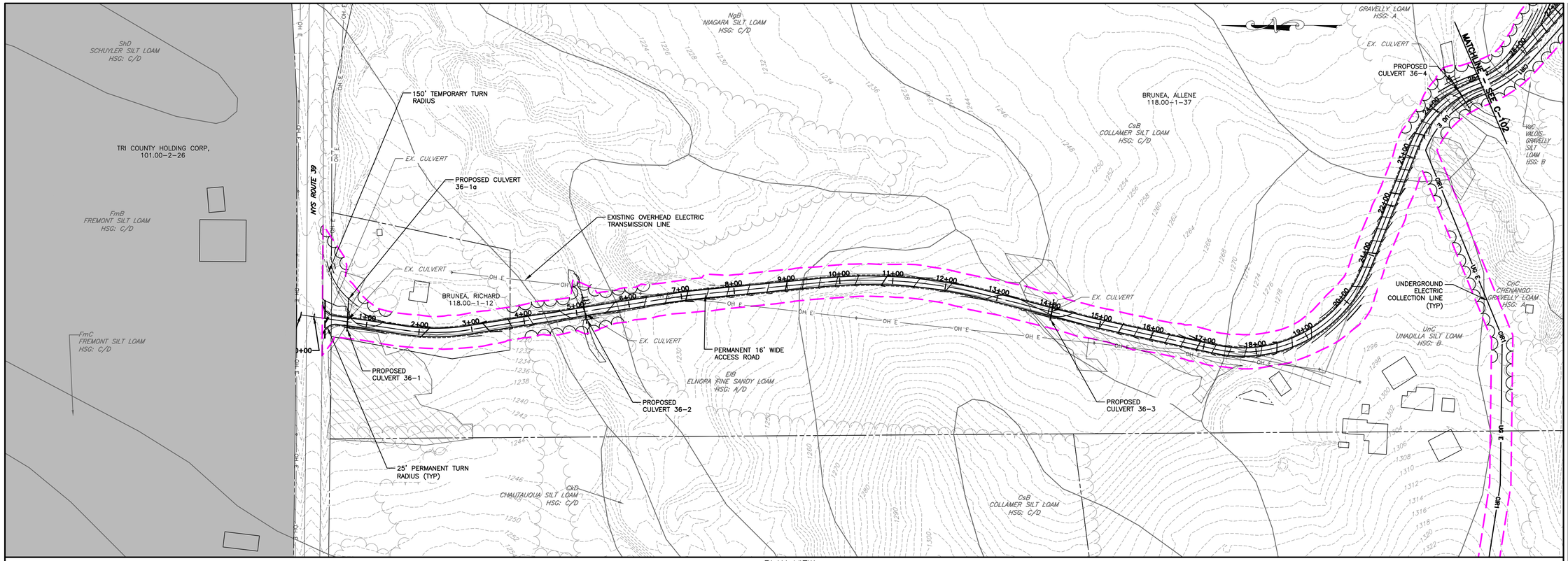

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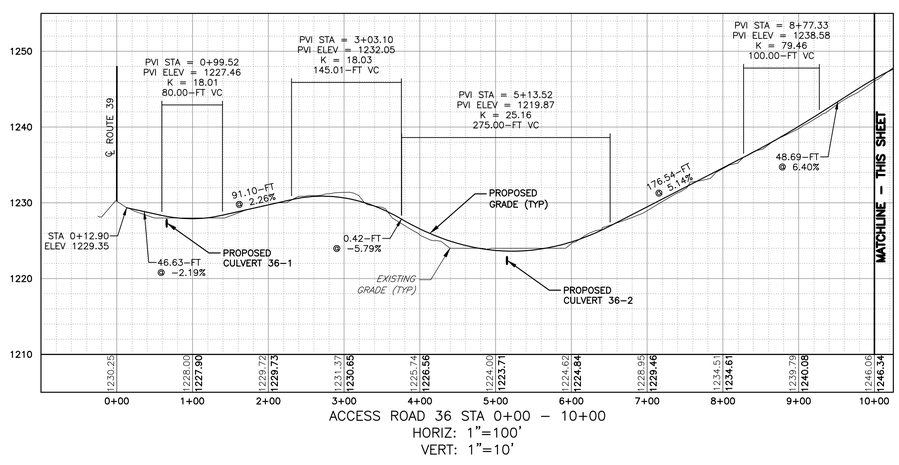

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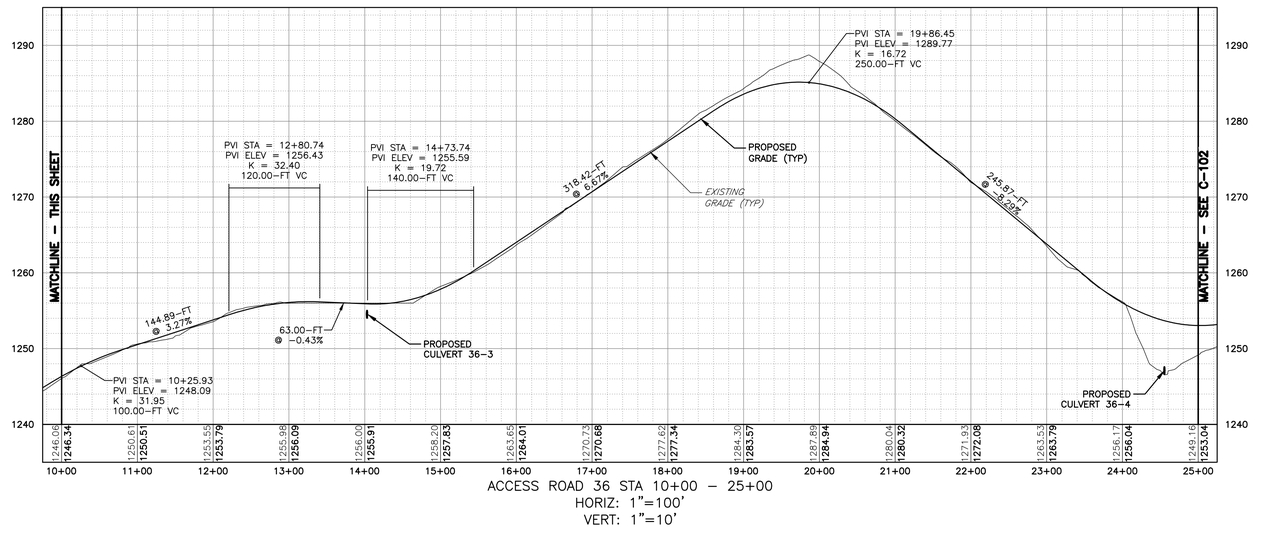

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WTG 36 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-101

SHEET 8 OF 81

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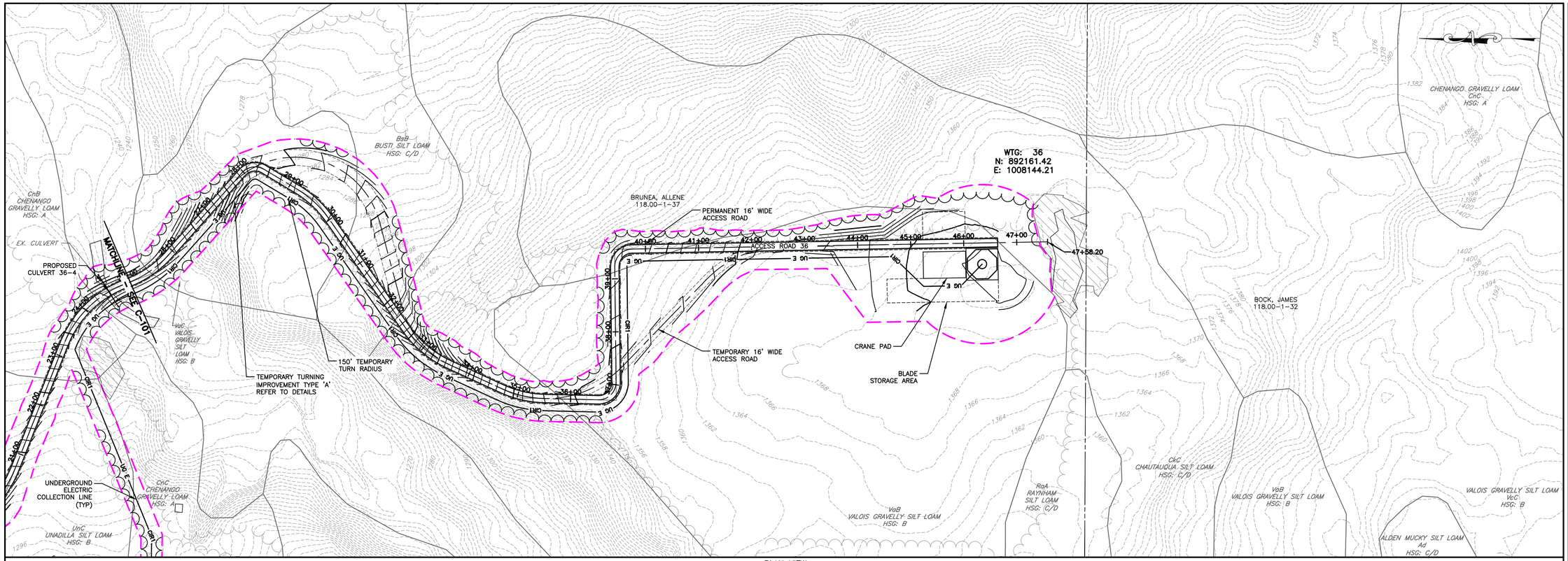

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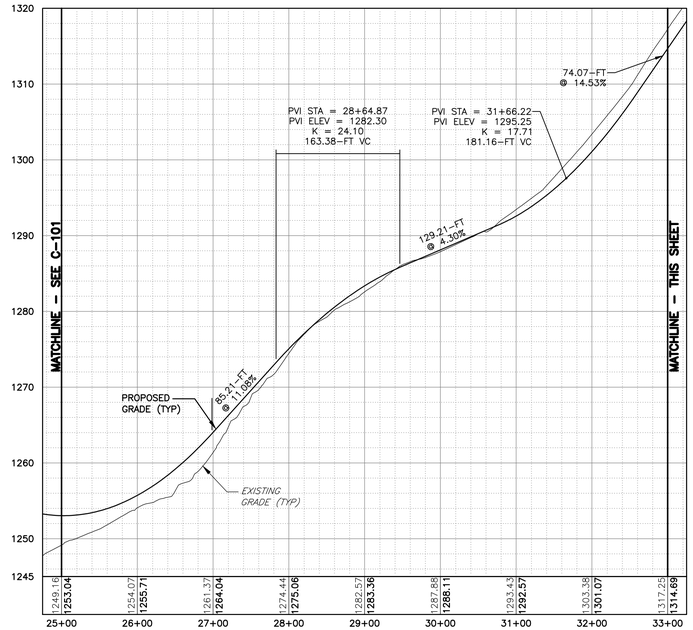

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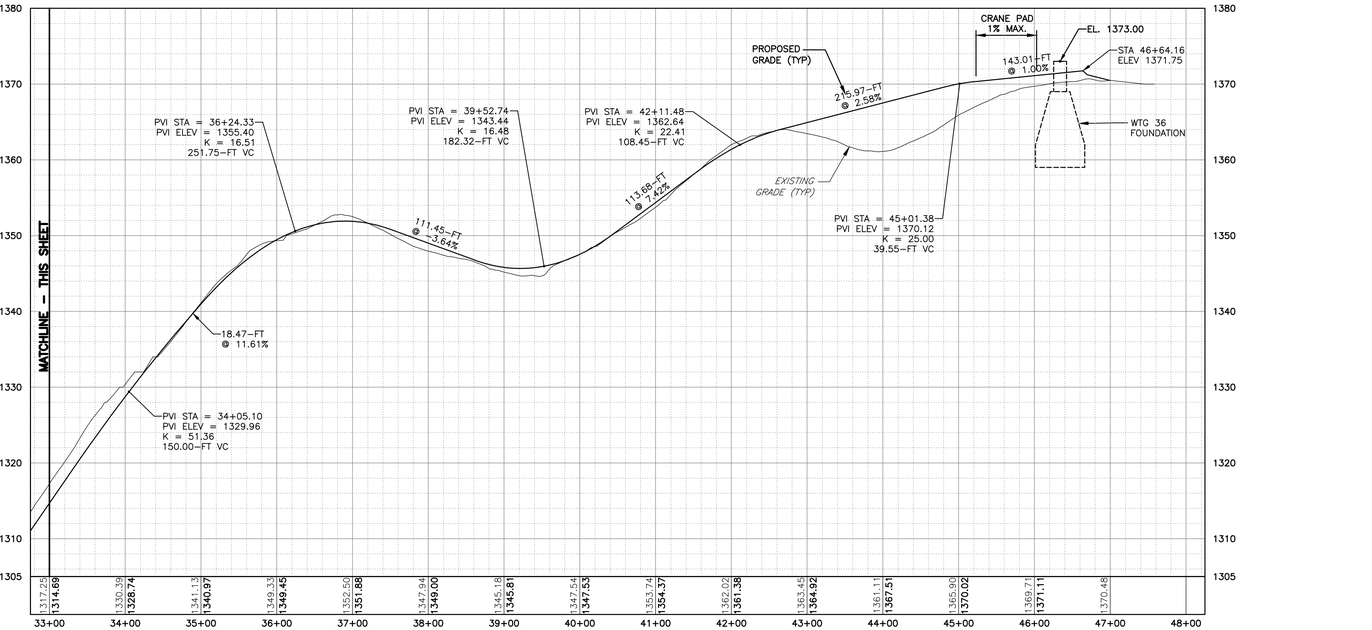

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C-102

SHEET 9 OF 81

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ACCESS ROAD 30 STA 6+00 – 23+50
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TITLE OF DRAWING
WTG 30 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-103

SHEET 10 OF 81

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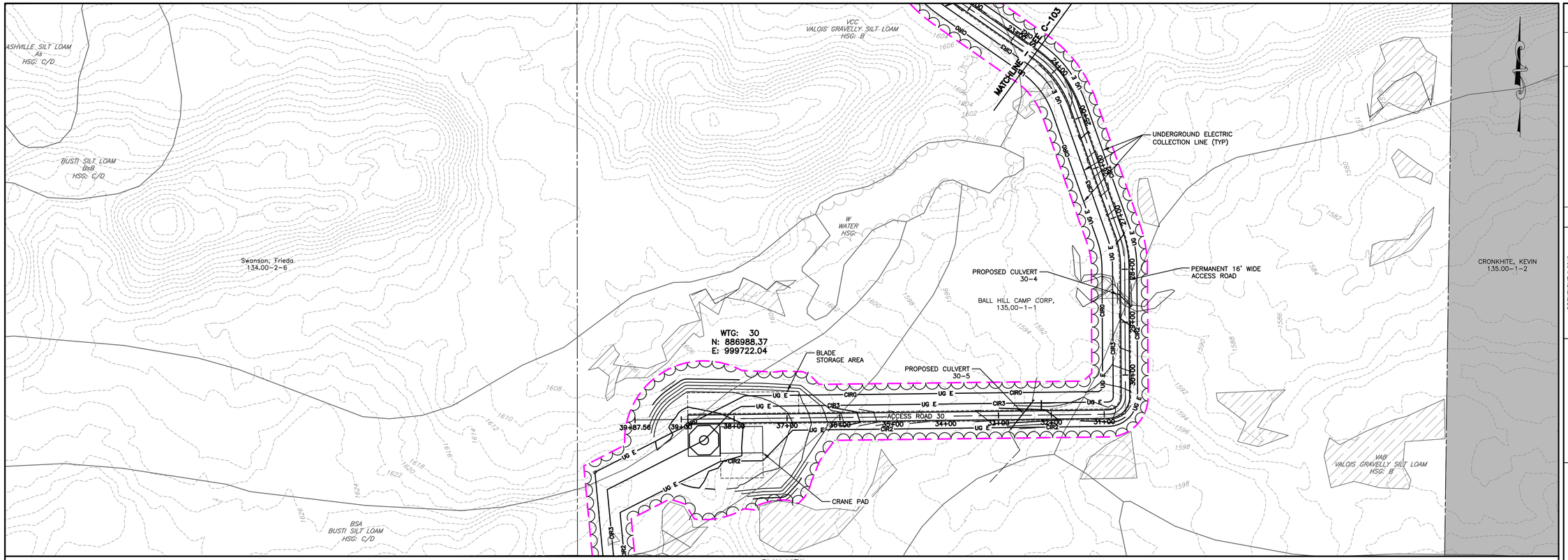

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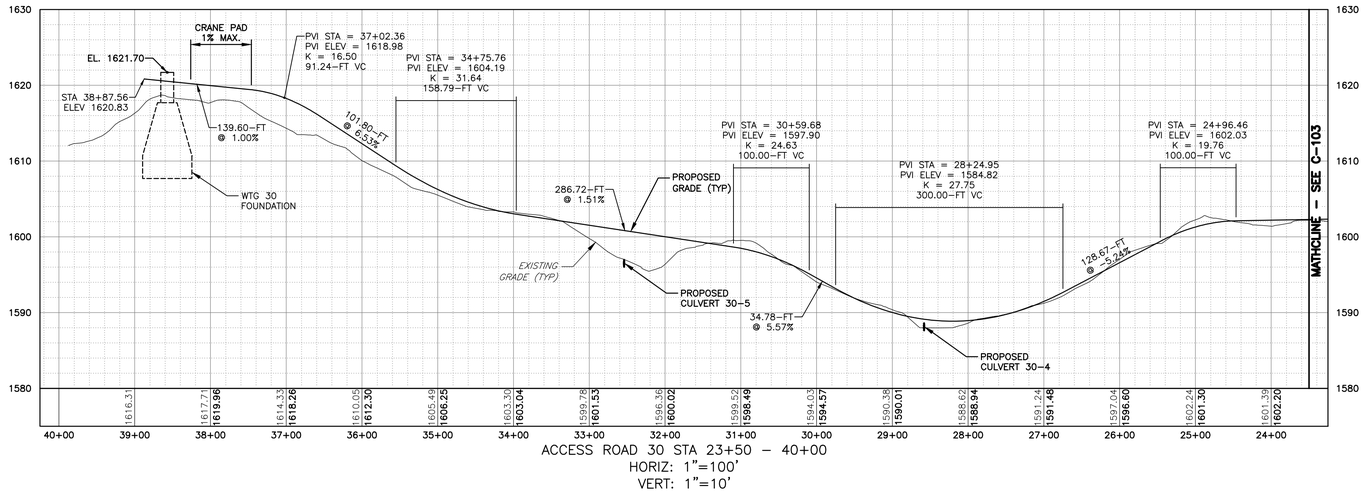

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WTG 30 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-104

SHEET 11 OF 81

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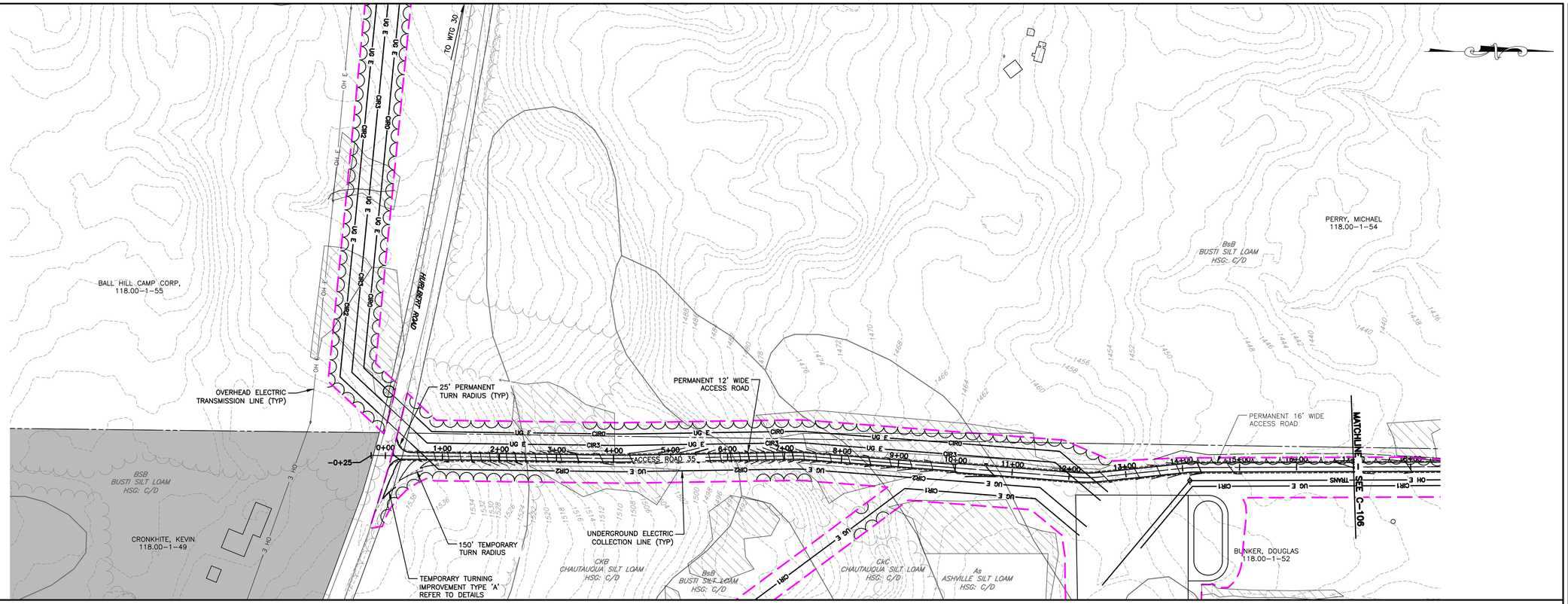

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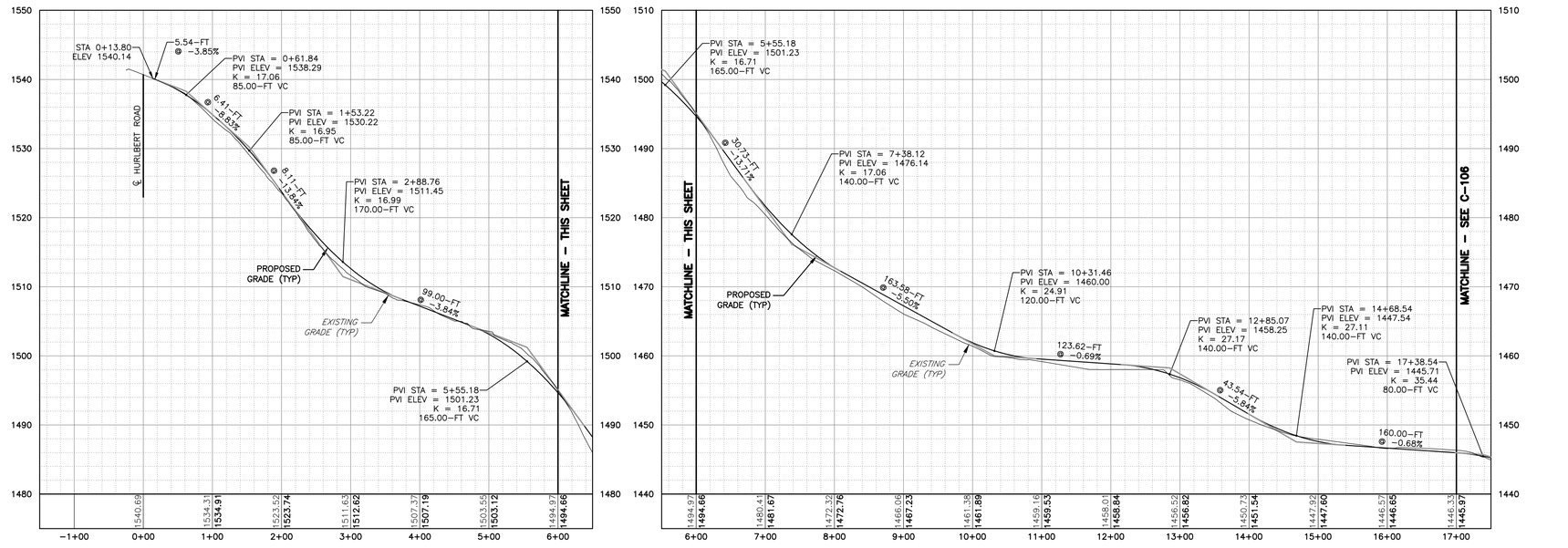

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TITLE OF DRAWING
WTG 35 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-105
SHEET 12 OF 81

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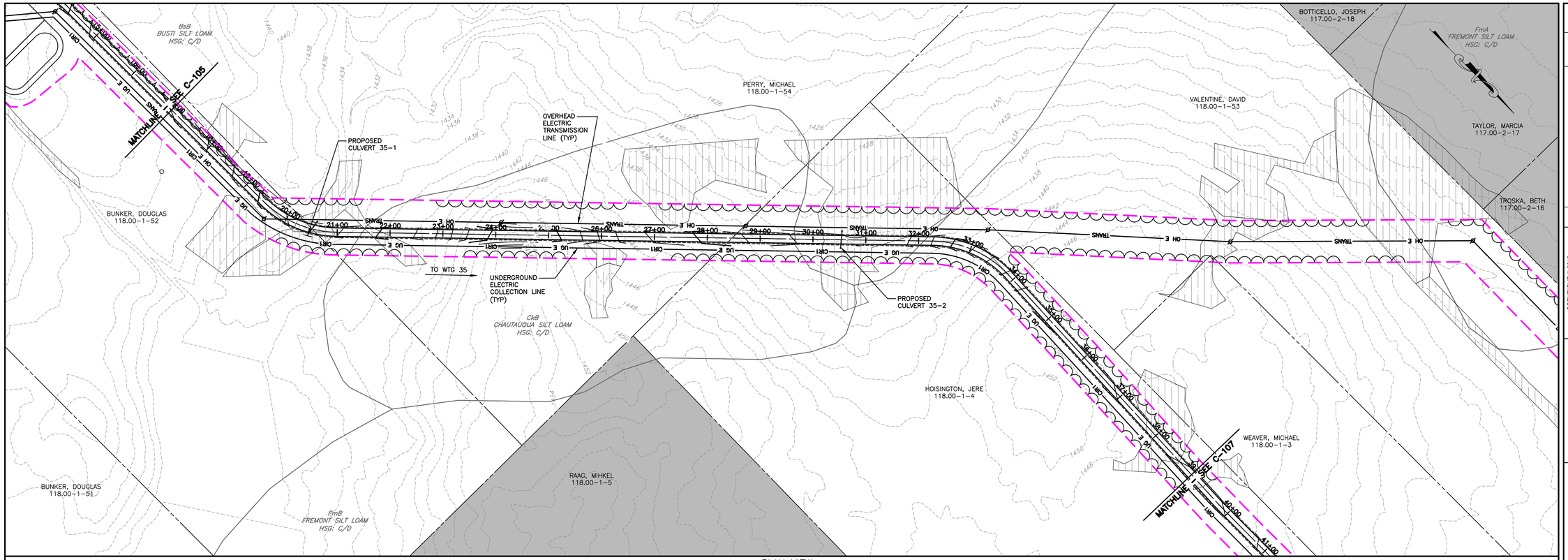

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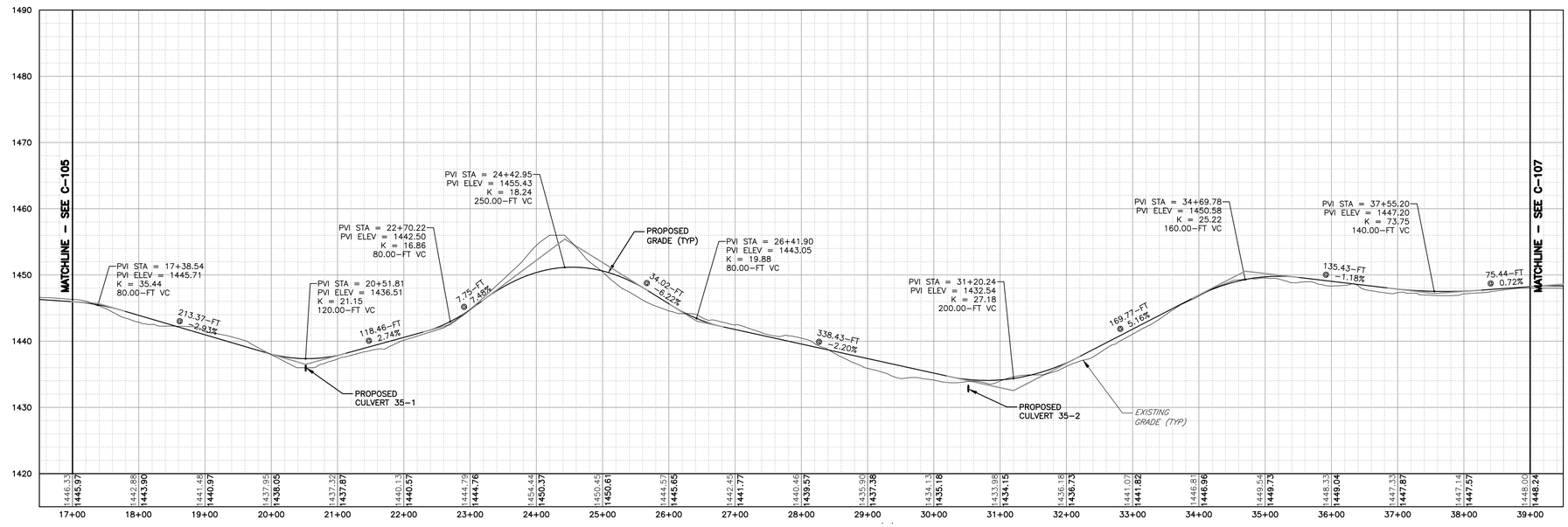

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WTG 35 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-106

SHEET 13 OF 81

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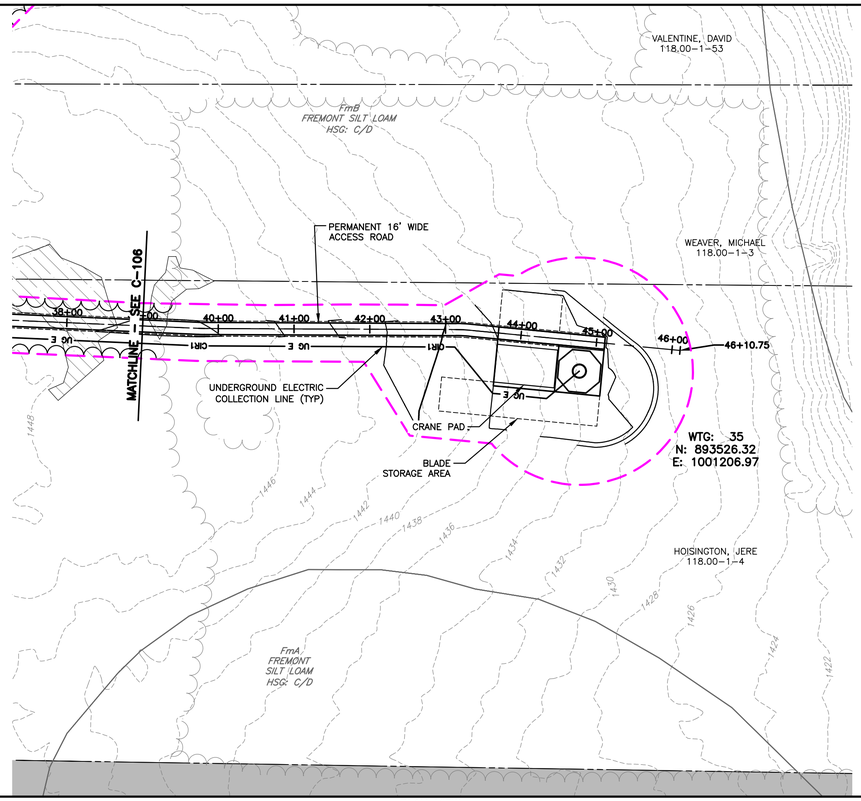
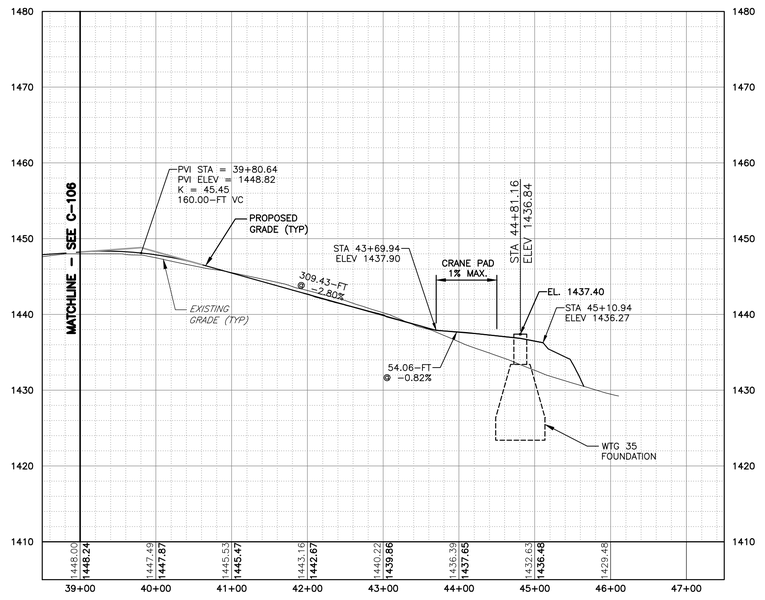


PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 35 STA 39+00 – 47+00
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
7			
6	FOR LAND DEV.		
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1			

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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
VT, TK
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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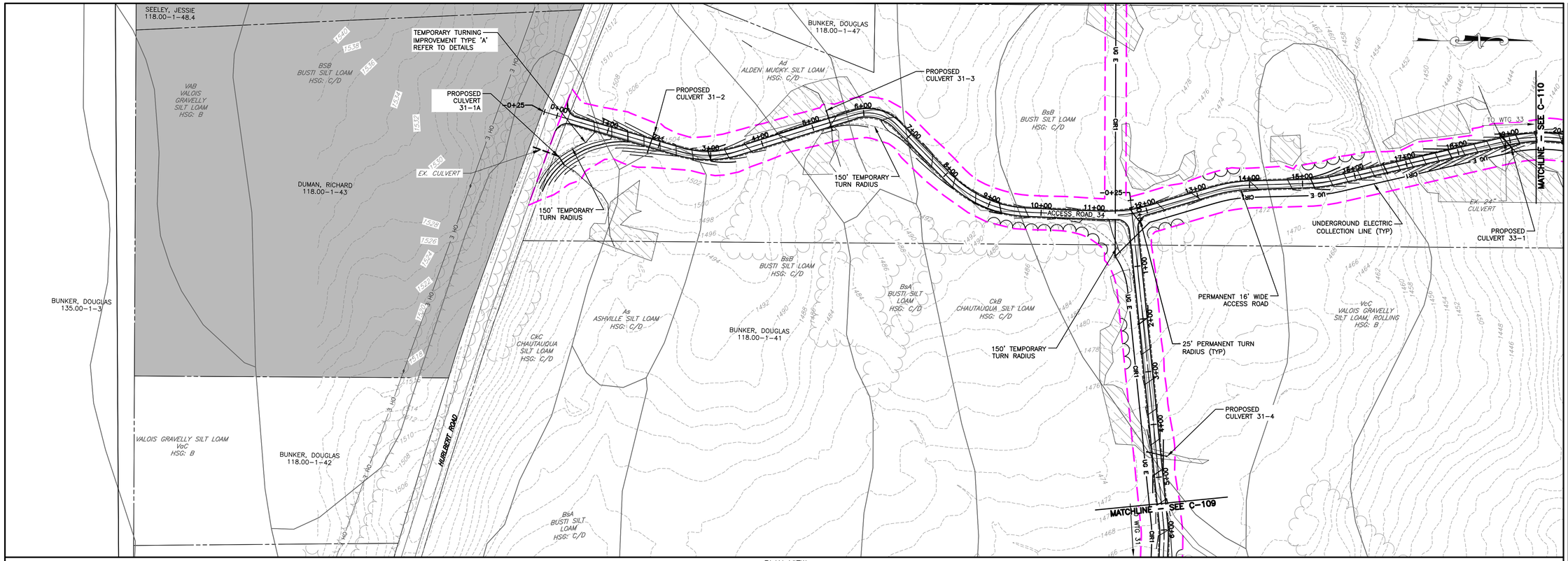
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 35 ACCESS RD PLAN & PROFILE

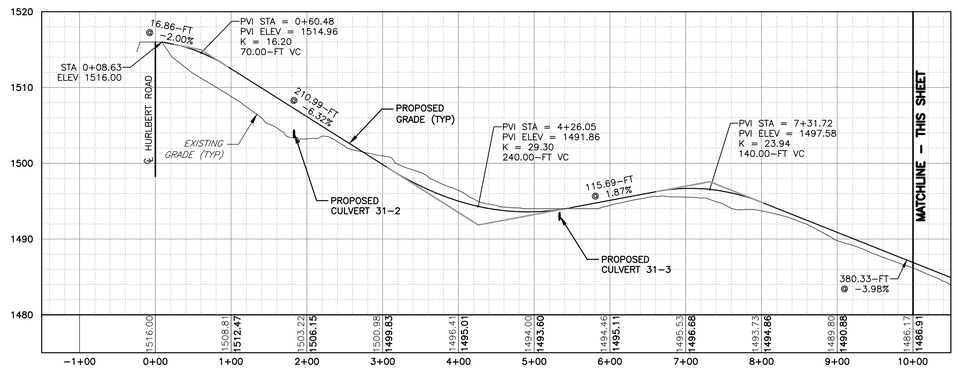
DRAWING NO.
C-107

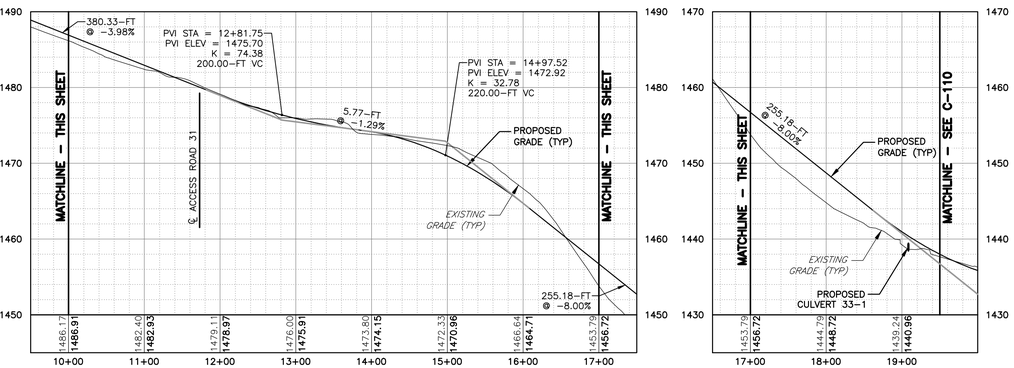
SHEET 14 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-105 - C-109.dwg
DATE/TIME: 10/14/2016 11:45:40 AM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'





ACCESS ROAD 34 STA 0+00 - 27+50
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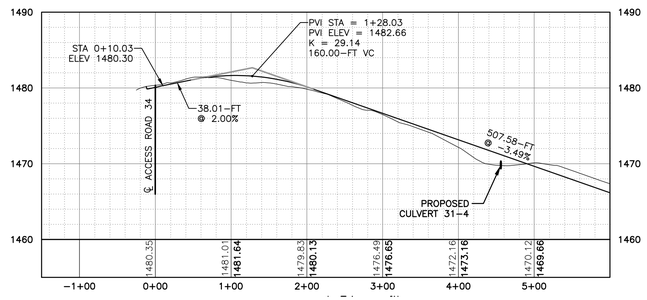

ACCESS ROAD 31 STA 0+00 - 5+50
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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1	FOR LAND OWNER REVIEW	10/14/16	TK

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FA PROJECT NO.
150001
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P. McCARTHY
DRAWN BY
VT, TK
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

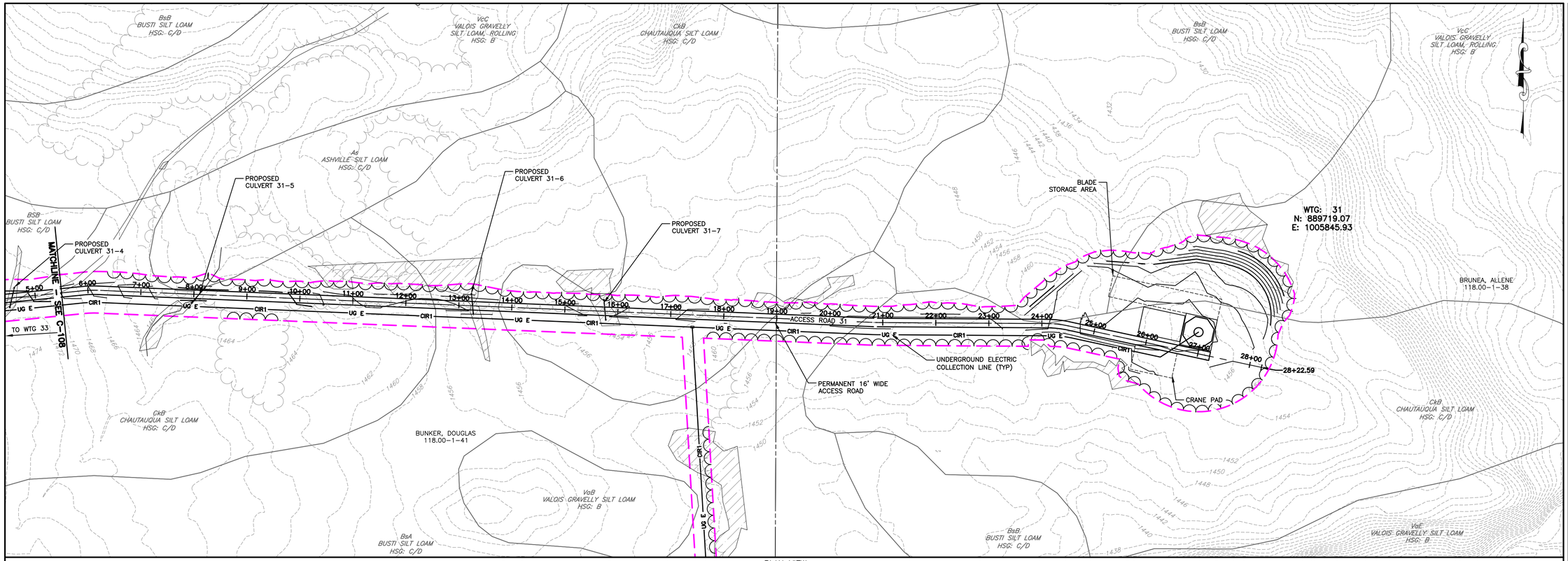
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 34 ACCESS RD PLAN & PROFILE

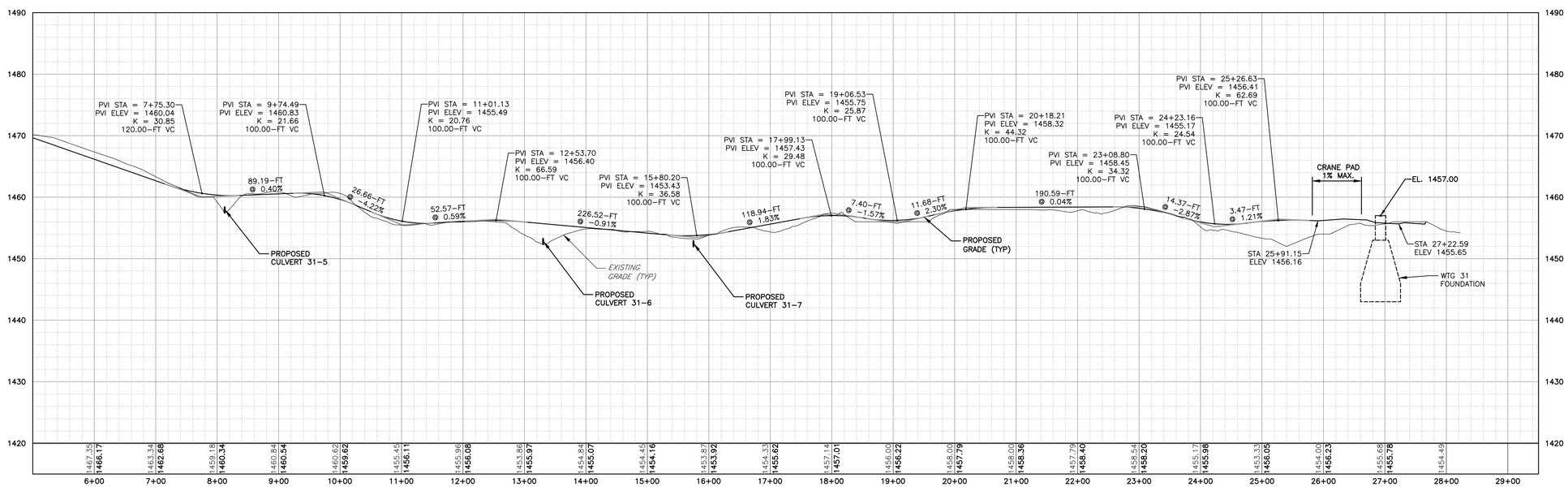
DRAWING NO.
C-108

SHEET 15 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-105 - C-109.dwg
DATE/TIME: 10/14/2016 11:46:54 AM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 31 STA 4+00 - 28+00
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
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SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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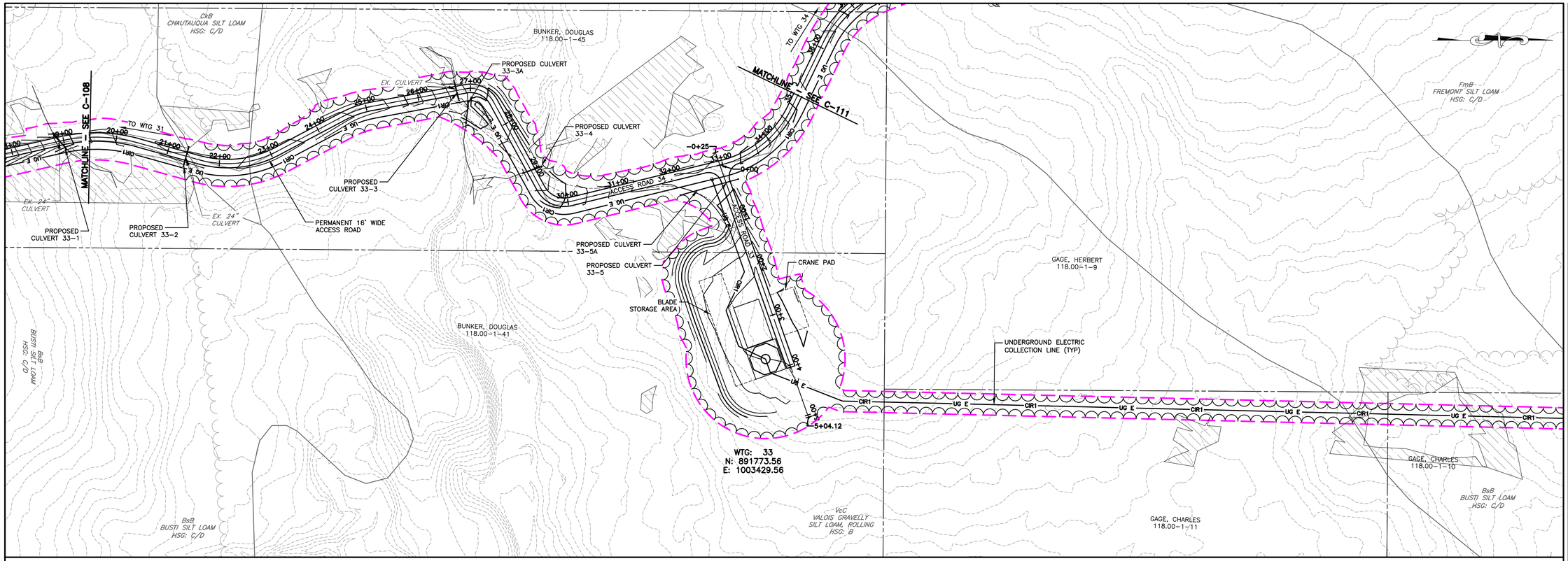
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 31 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-109

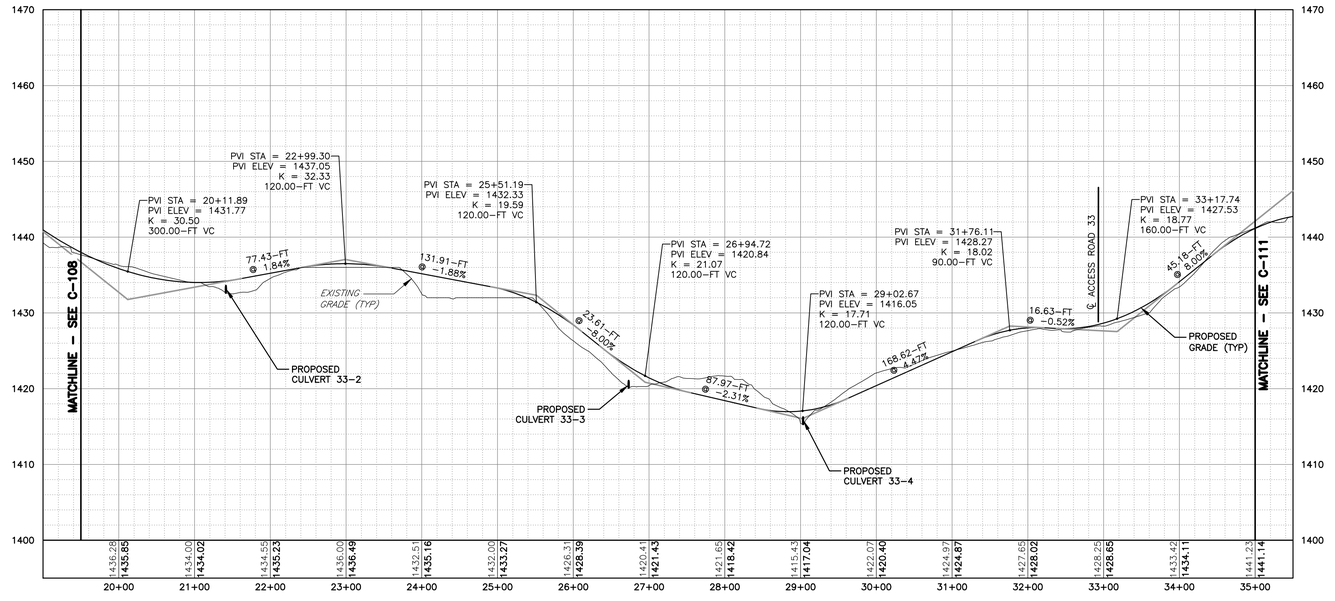
SHEET 16 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-105 - C-109.dwg
DATE/TIME: 10/14/2016 11:47:46 AM
USER: Steven Mellott

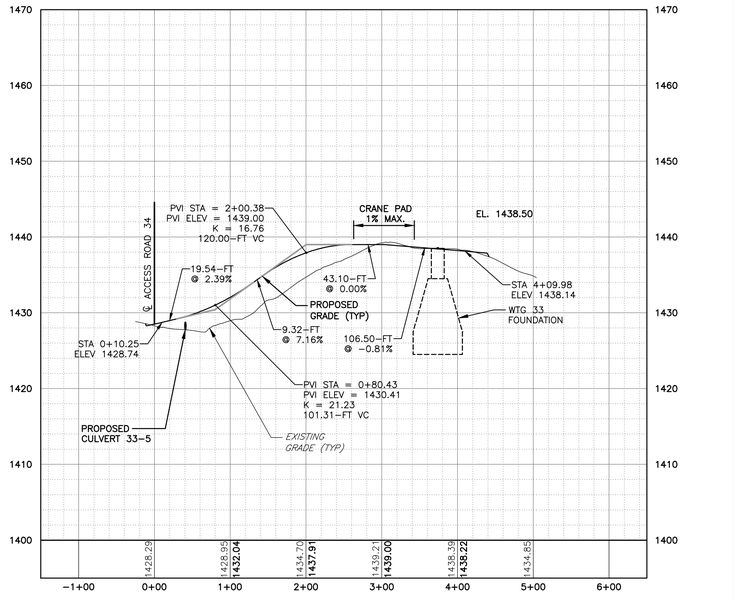


PLAN VIEW

SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 34 STA 19+50 – 35+00
HORIZ: 1"=100'
VERT: 1"=10'



ACCESS ROAD 33 STA 0+00 – 5+00
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
150001

PROJECT MANAGER
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SCALE
AS SHOWN

ISSUE DATE
OCT. 2016

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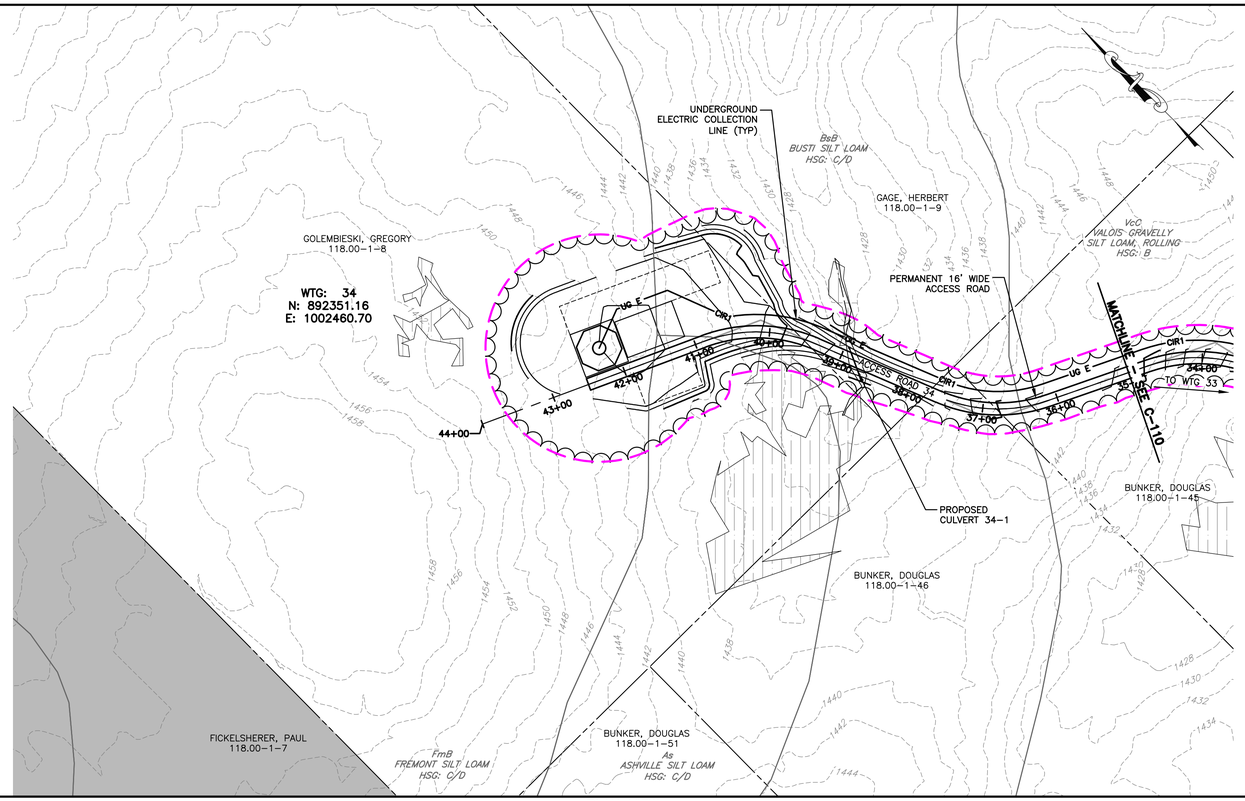
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 33 ACCESS RD PLAN & PROFILE

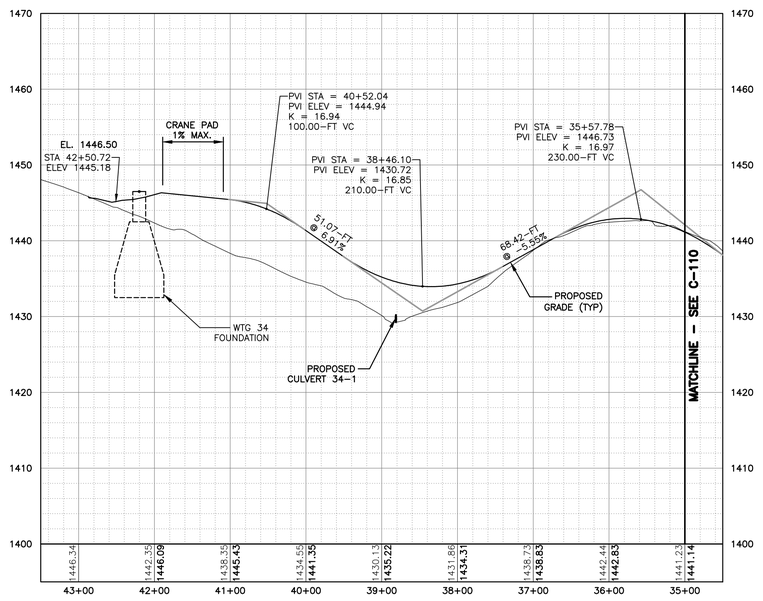
DRAWING NO.
C-110

SHEET 17 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-110 - C-114.dwg
DATE/TIME: 10/14/2016 11:50:33 AM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 34 STA 35+00 - 43+50
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
7			
6	FINAL LAYOUT		
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
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SCALE
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ISSUE DATE
OCT. 2016

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BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 34 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-111

SHEET 18 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-110 - C-114.dwg
DATE/TIME: 10/14/2016 11:51:19 AM
USER: Steven Mellott

WTG: 27
N: 886082.54
E: 1004026.31

BUNKER, DOUGLAS
135.00-1-3

SnD
SCHUYLER SILT LOAM
HSG: C/D

BUNKER, DOUGLAS
118.00-1-39

BUNKER, DOUGLAS
135.00-2-1

BeB
BUSTI SILT LOAM
HSG: C/D

CRANE PAD

BLADE STORAGE AREA

25' PERMANENT TURN RADIUS (TYP)

PROPOSED CULVERT 27-1

HURLBERT ROAD

UNDERGROUND ELECTRIC COLLECTION LINE (TYP)

PERMANENT 16' WIDE ACCESS ROAD

TEMPORARY TURNING IMPROVEMENT TYPE 'A' REFER TO DETAILS

150' TEMPORARY TURN RADIUS

PROPOSED CULVERT 27-1a

CoB
CHENANGO CHANNERY LOAM
HSG: A

As
ASHVILLE SILT LOAM
HSG: C/D

LOMANTO, MICHAEL
135.00-1-6

ACCESS ROAD 27

OkB
CHAUTAUQUA SILT LOAM
HSG: C/D

CkC
CHAUTAUQUA SILT LOAM
HSG: C/D

BeB
BUSTI SILT LOAM
HSG: C/D

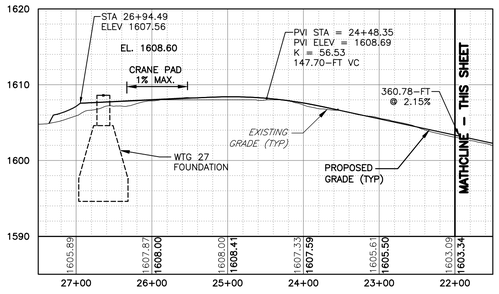
CHAGRIN LAND LIMITED PARTNERSHIP,
135.00-2-6

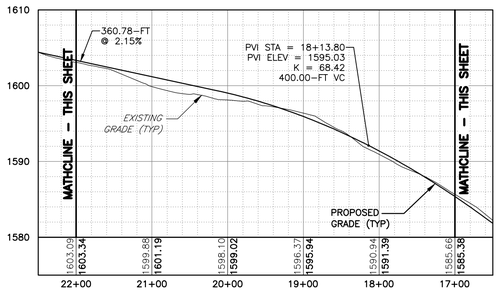
WESTLUND, HEATHER
135.00-2-47

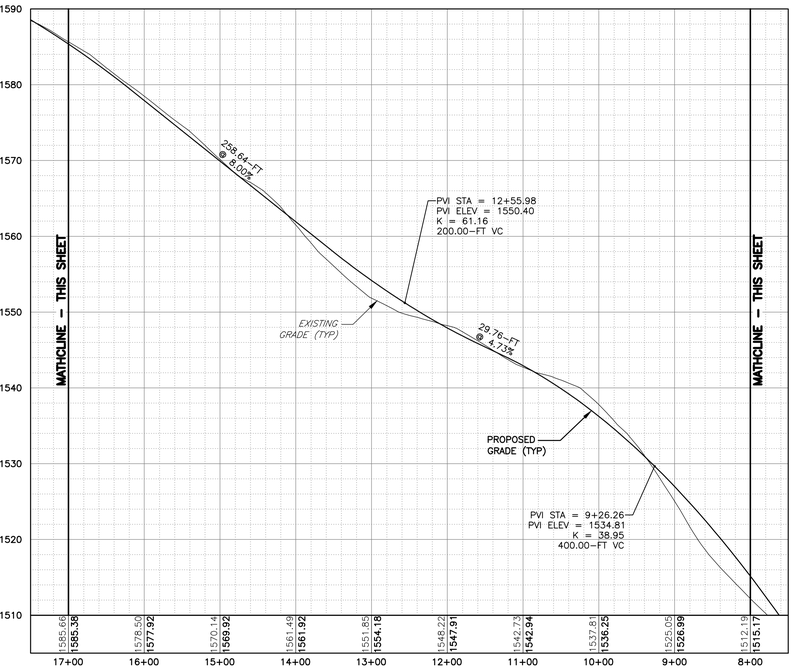
WESTLUND, BENJAMIN
135.00-2-2

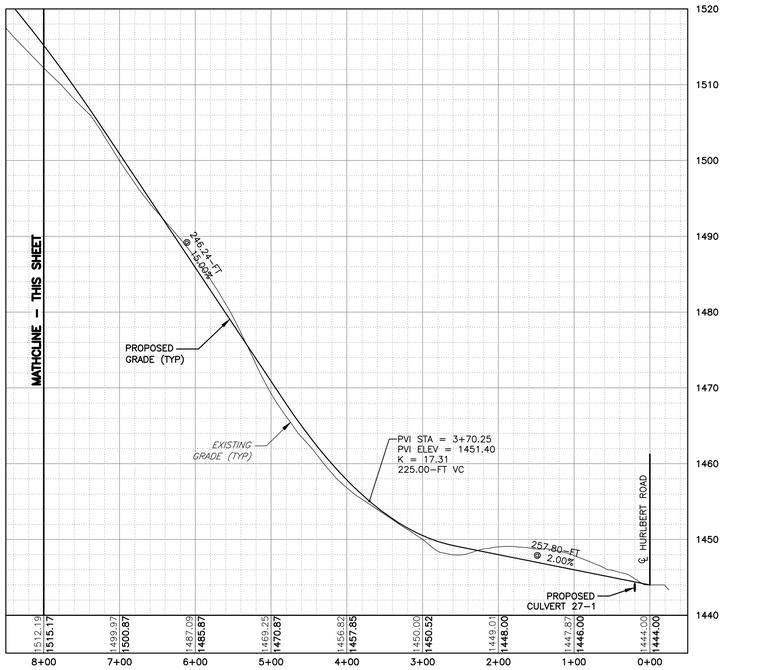
SNOW, GREGORY
135.00-2-46

PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'









ACCESS ROAD 27 STA 27+50 – 0+00
HORIZ: 1"=100'
VERT: 1"=10'

100 0 100 200 300
FEET
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
7			
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY

DRAWN BY
VT, TK
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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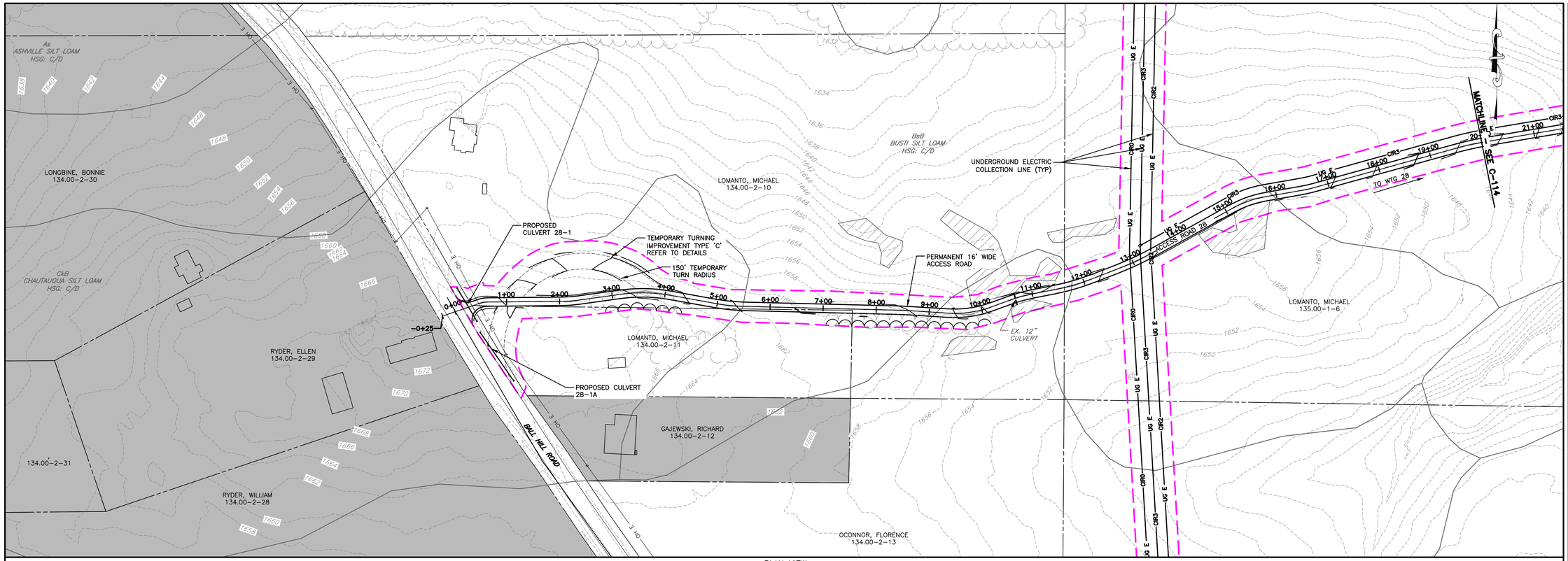
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 27 ACCESS RD PLAN & PROFILE

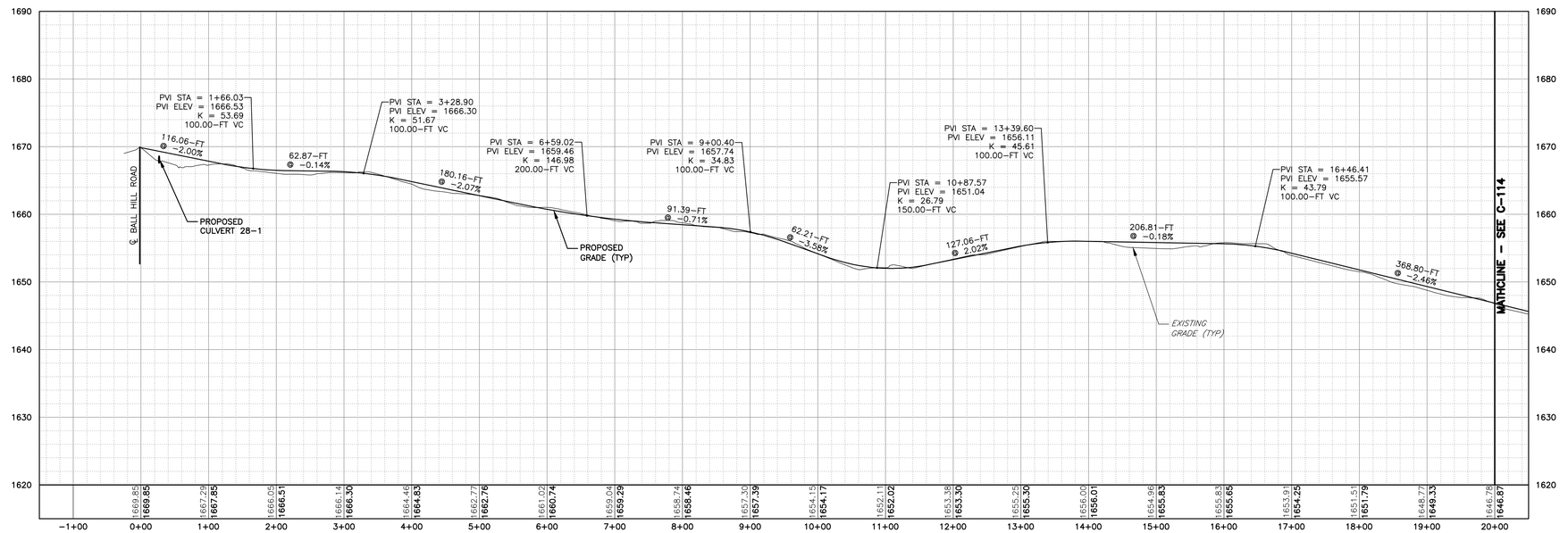
DRAWING NO.
C-112

SHEET 19 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-110 - C-114.dwg
DATE/TIME: 10/14/2016 11:52:03 AM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 28 STA 0+00 - 18+00
HORIZ: 1"=100'
VERT: 1"=10'

FEET 100 0 100 200 300
Scale: 1"=100'

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-110 - C-114.dwg
DATE/TIME: 10/14/2016 11:52:41 AM
USER: Steven Mellott

REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
VT, TK
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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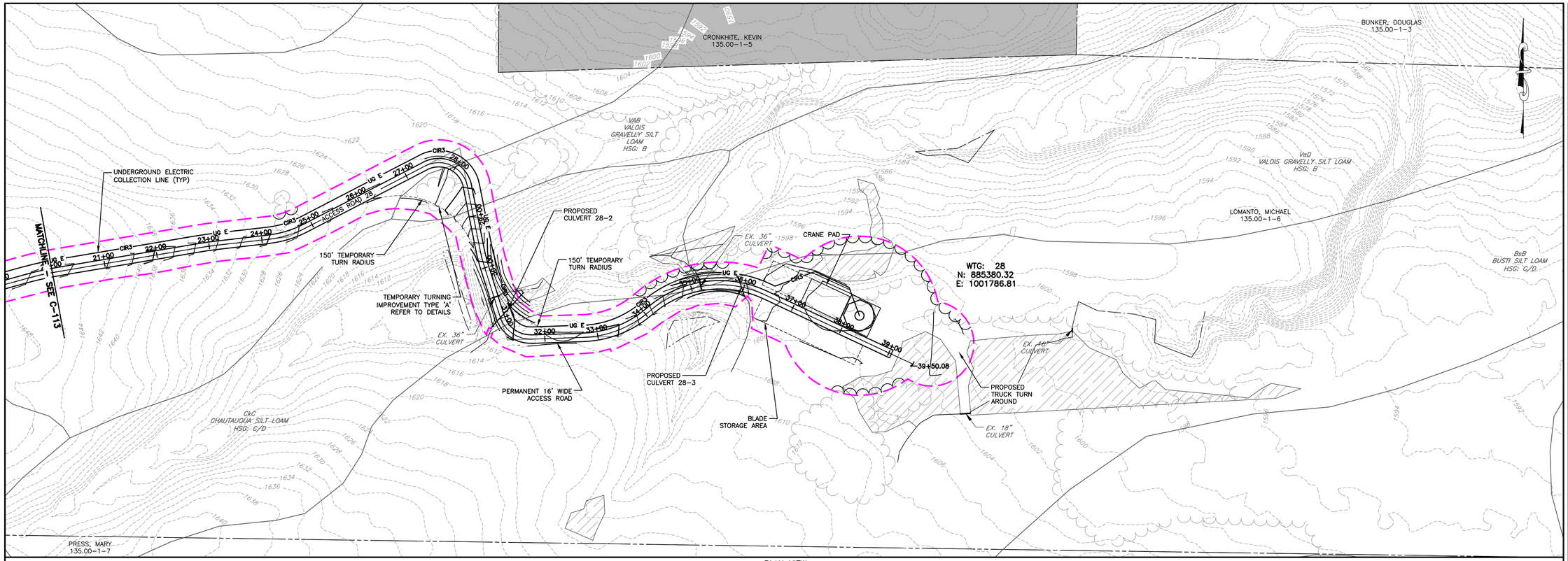
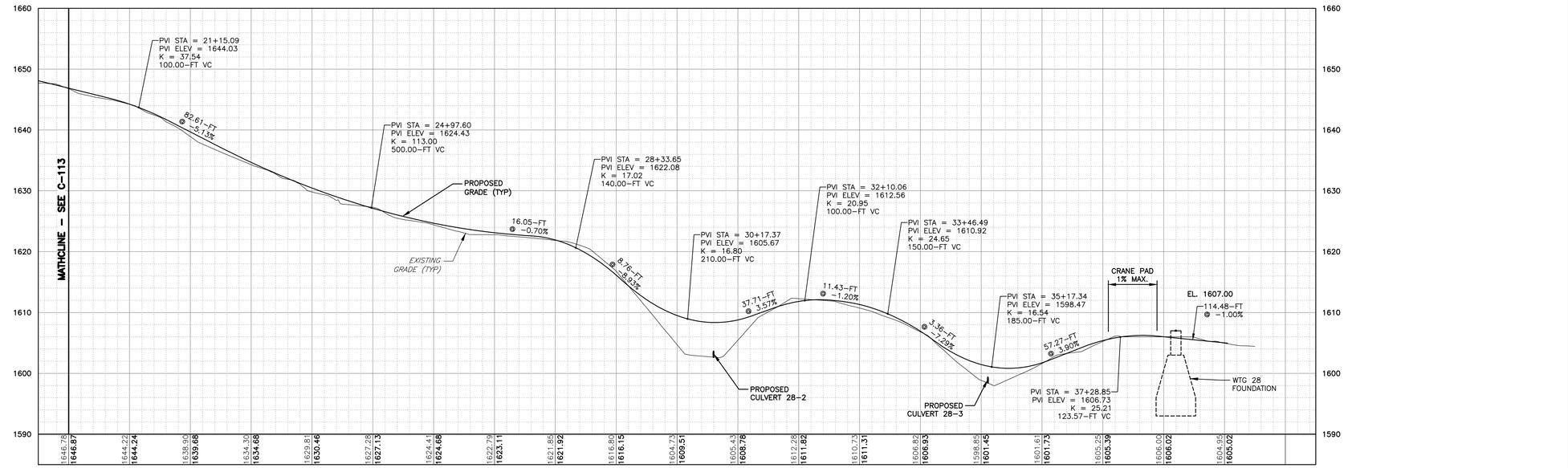
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 28 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-113



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 28 STA 20+00 - 40+50
HORIZ: 1"=100'
VERT: 1"=10'

REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
VT, TK
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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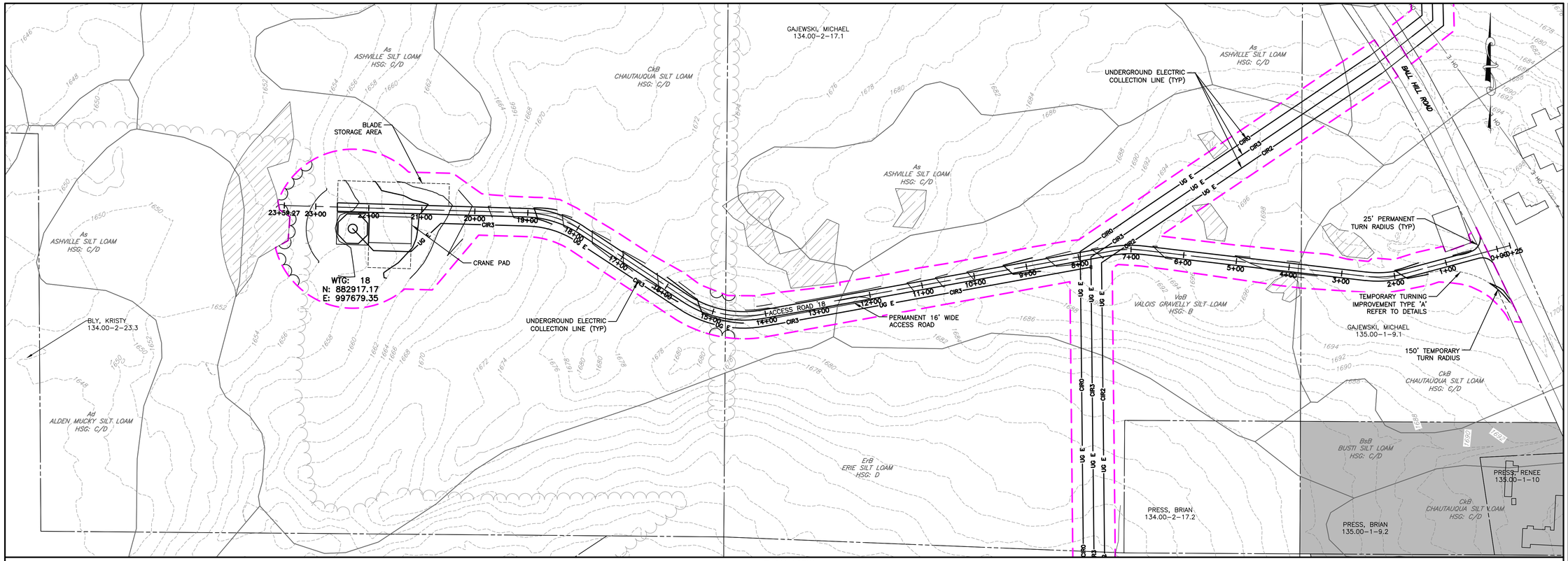
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 28 ACCESS RD PLAN & PROFILE

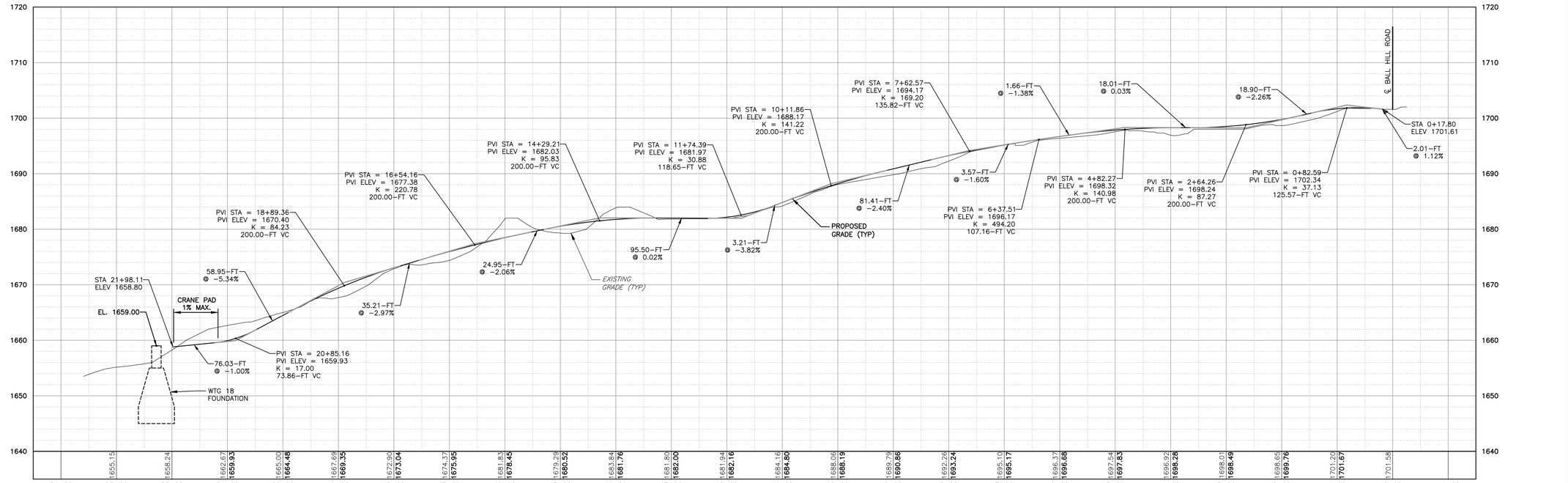
DRAWING NO.
C-114

SHEET 21 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-110 - C-114.dwg
DATE/TIME: 10/14/2016 11:53:22 AM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 18 PROFILE
HORIZ: 1"=100'
VERT: 1"=10'

100 0 100 200 300
FEET
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
7			
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
VT, TK
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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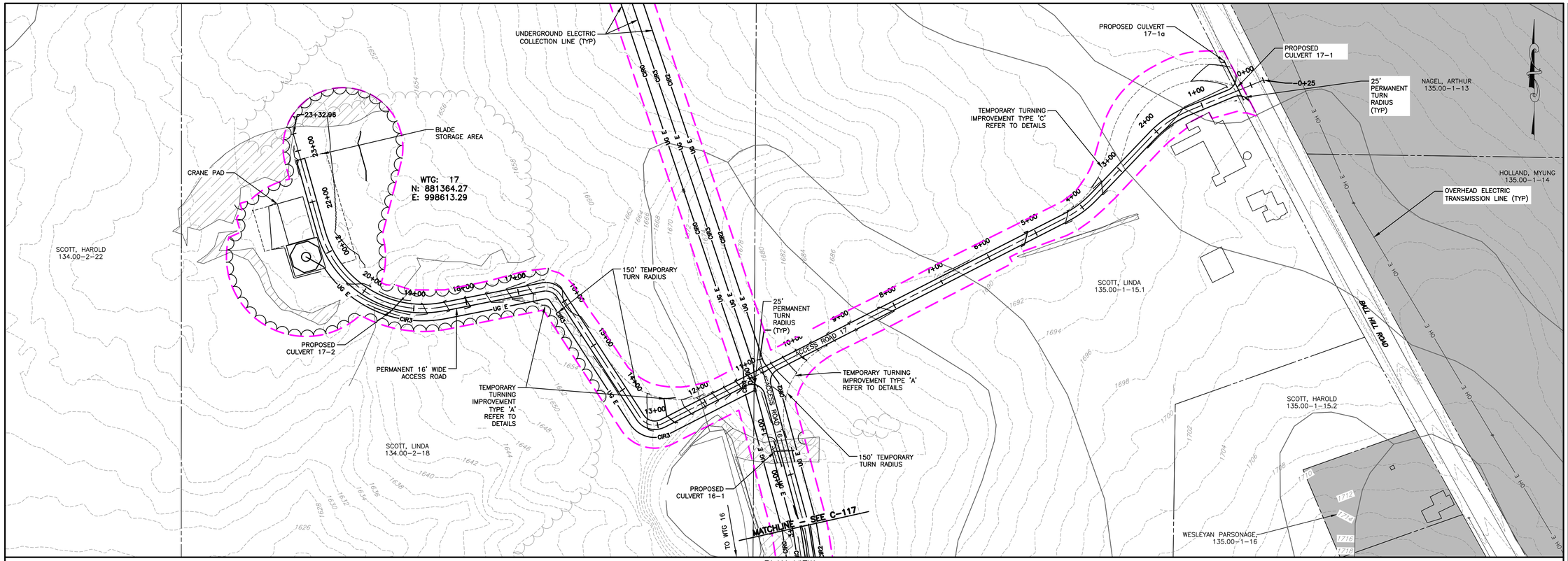
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 18 ACCESS RD PLAN & PROFILE

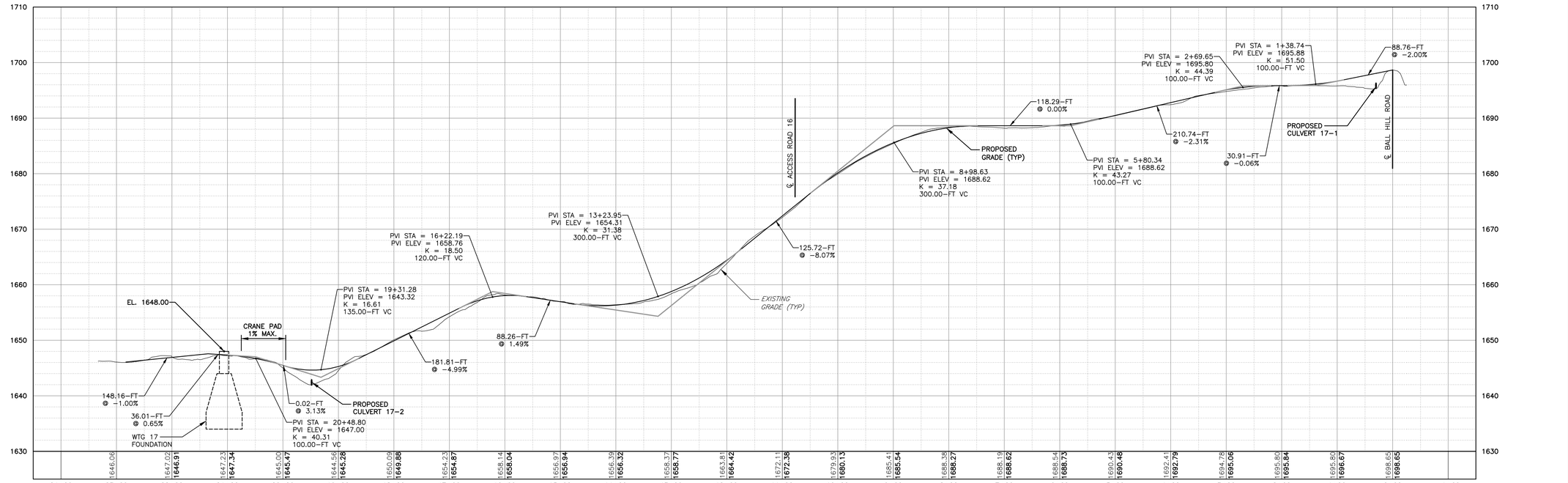
DRAWING NO.
C-115

SHEET 22 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-115 - C-119.dwg
DATE/TIME: 10/14/2016 11:55:36 AM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



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DATE/TIME: 10/14/2016 11:56:14 AM
USER: Steven Mellott

REV	DESCRIPTION	DATE	BY
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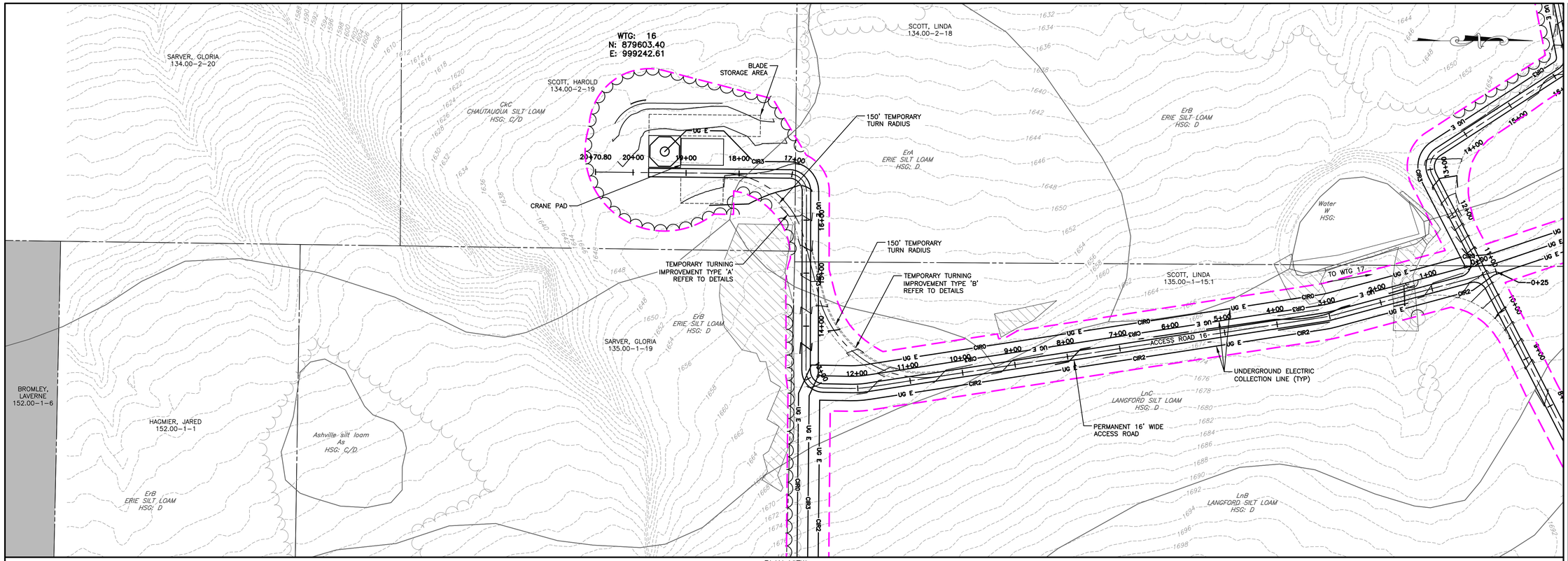
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 17 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-116

SHEET 23 OF 81



PLAN VIEW
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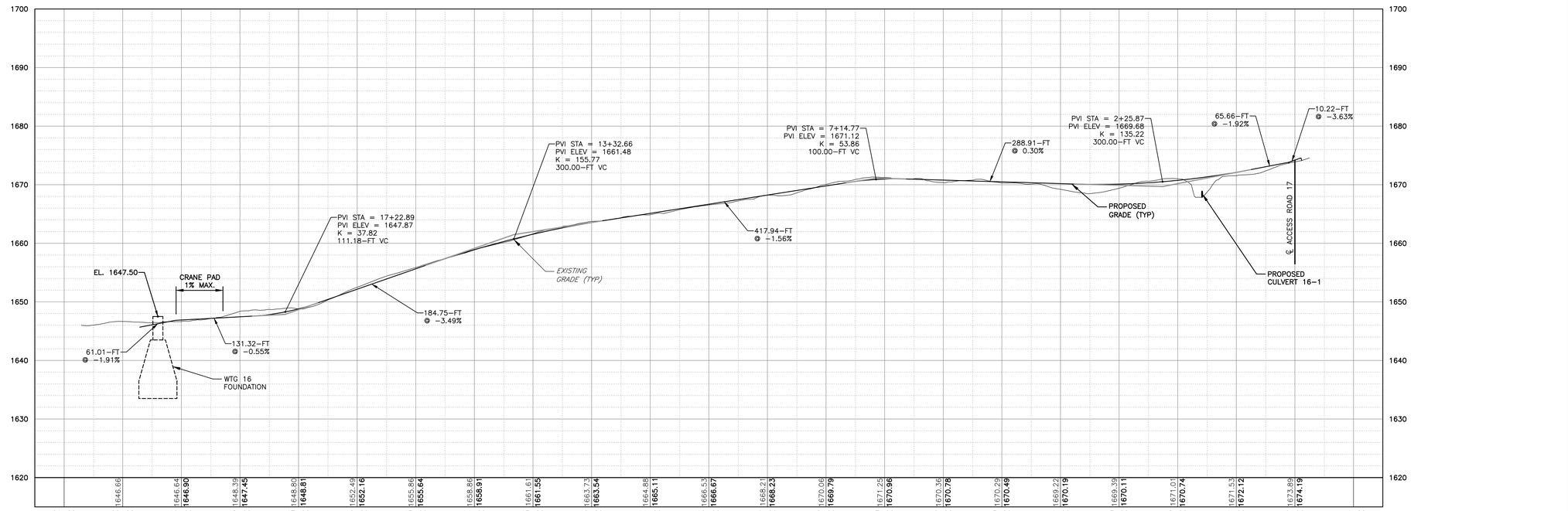
22X34 1"=100'



ACCESS ROAD 16 PROFILE
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FEET
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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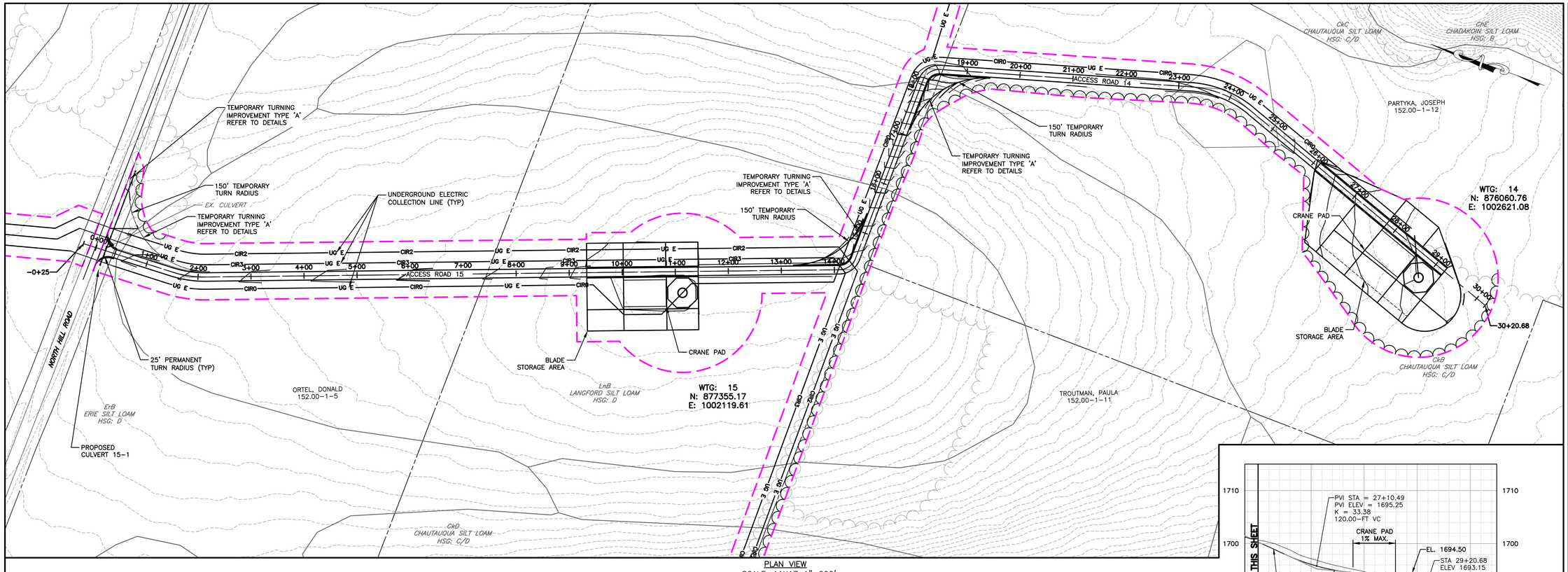
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 16 ACCESS RD PLAN & PROFILE

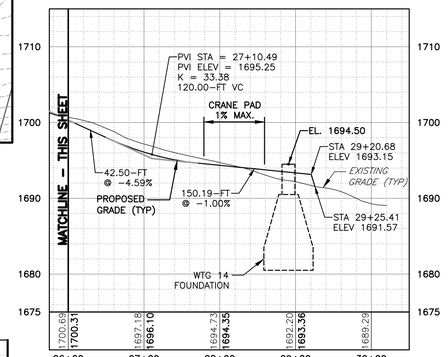
DRAWING NO.
C-117

SHEET 24 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-115 - C-119.dwg
DATE/TIME: 10/14/2016 11:56:52 AM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



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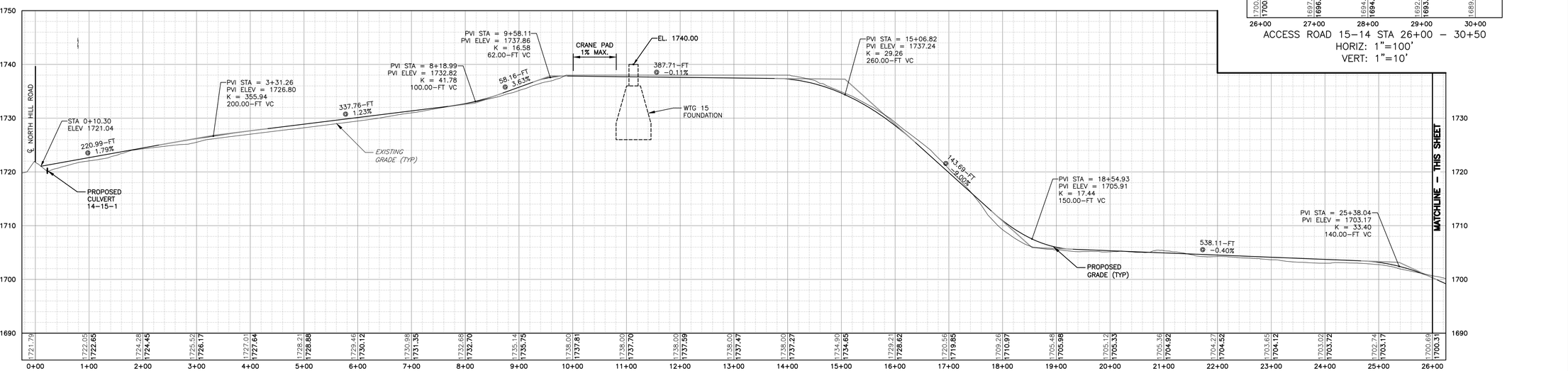

ACCESS ROAD 15-14 STA 0+00 - 29+50
HORIZ: 1"=100'
VERT: 1"=10'

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Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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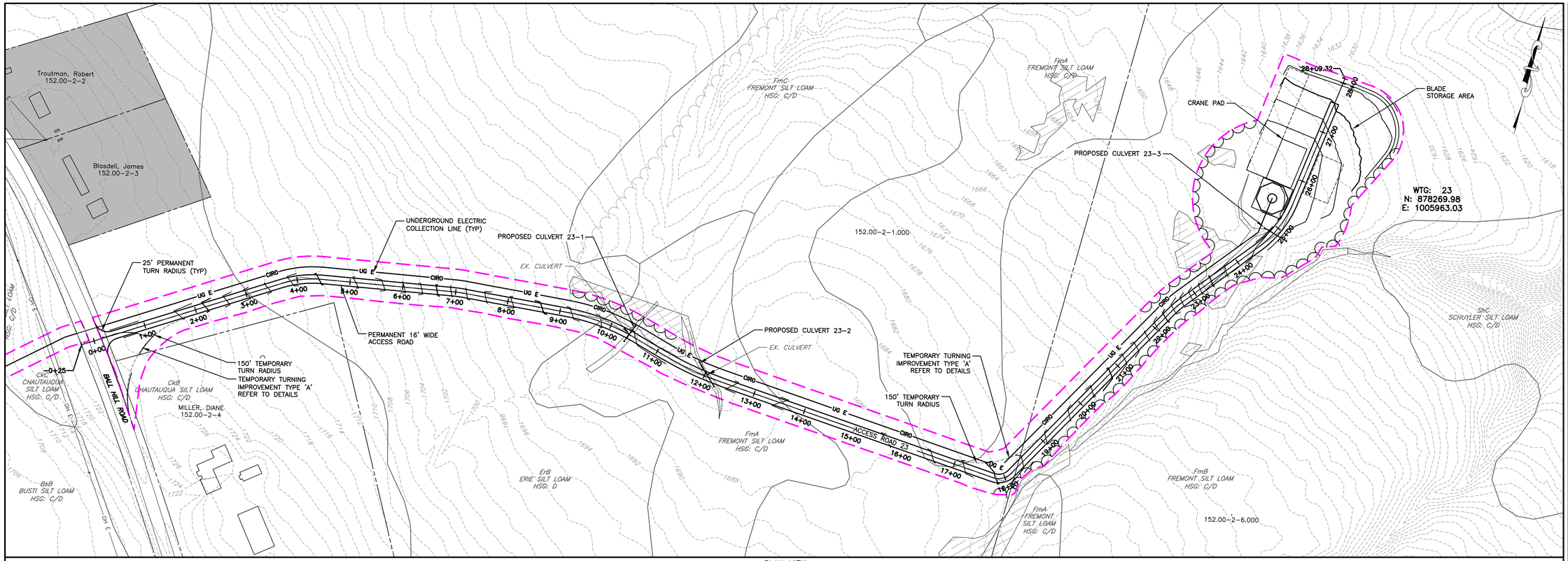
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 15 ACCESS RD PLAN & PROFILE

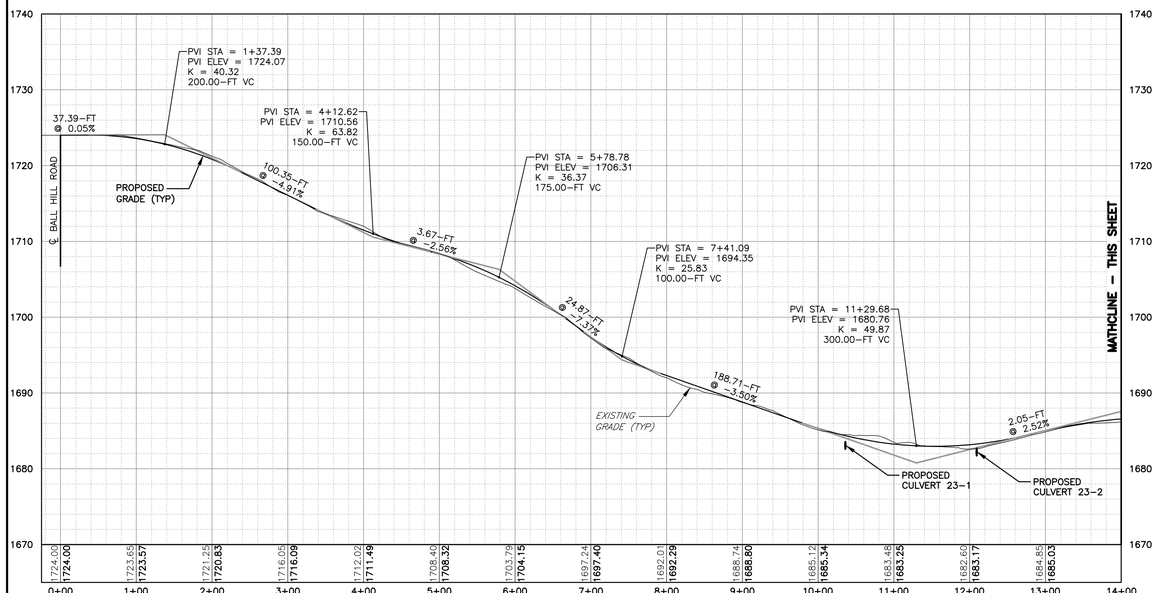
DRAWING NO.
C-118

SHEET 25 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-115 - C-119.dwg
DATE/TIME: 10/14/2016 11:57:42 AM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



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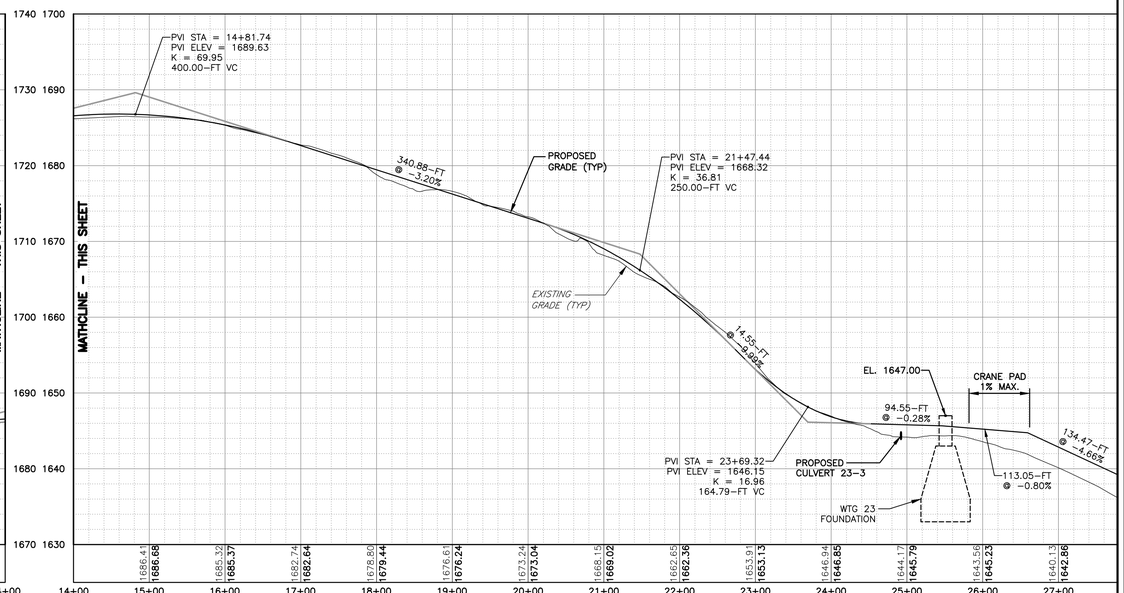

ACCESS ROAD 23 STA 14+00 - 28+00
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FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-115 - C-119.dwg
DATE/TIME: 10/14/2016 11:58:19 AM
USER: Steven Mellott

REV	DESCRIPTION	DATE	BY
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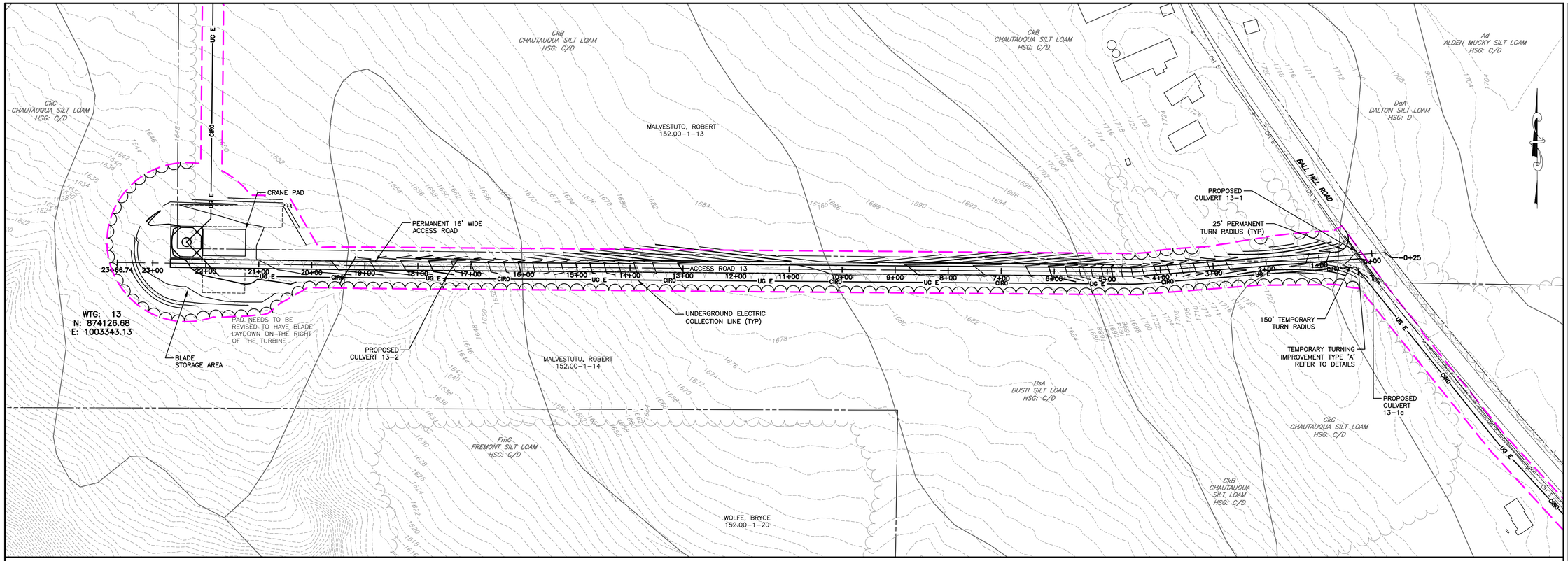
PRELIMINARY PLANS

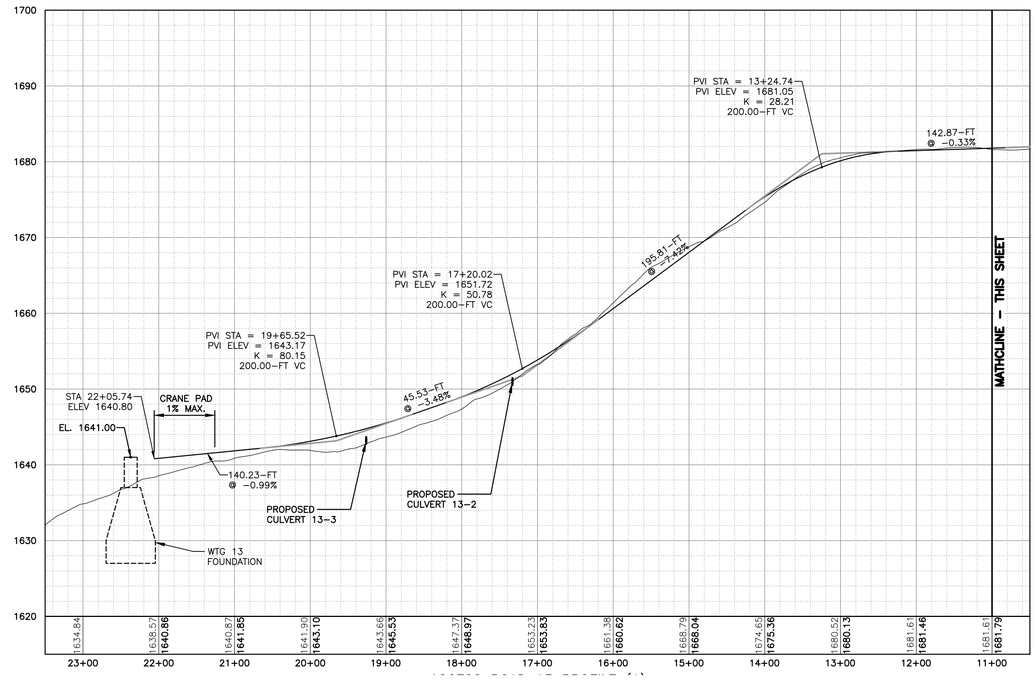
TITLE OF DRAWING
WTG 23 ACCESS RD PLAN & PROFILE

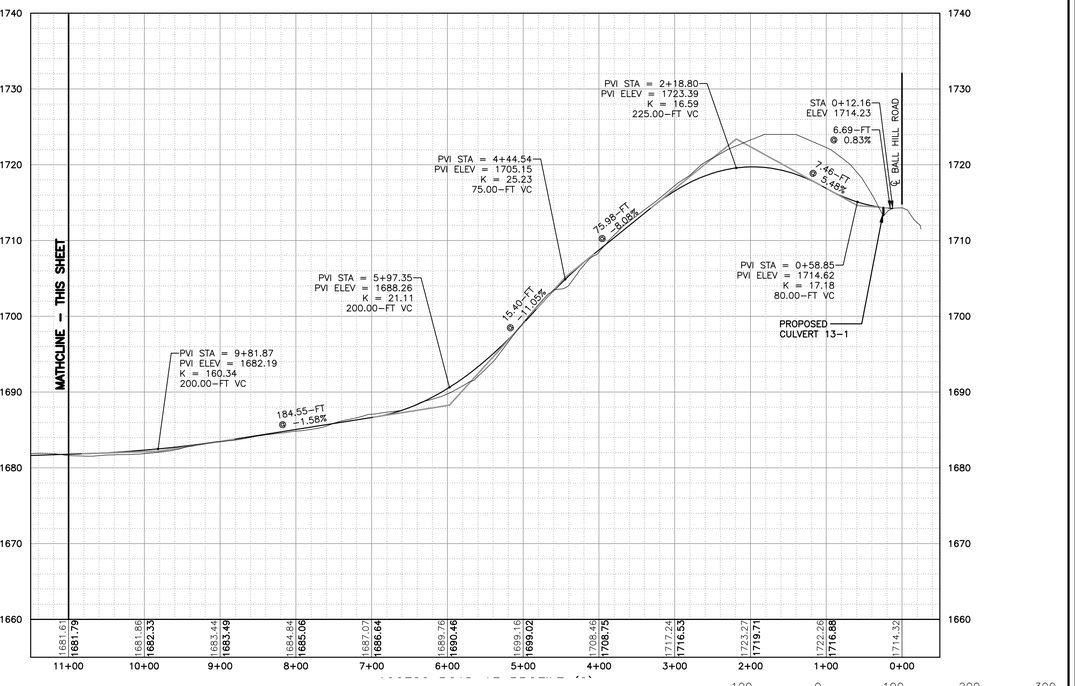
DRAWING NO.
C-119

SHEET 26 OF 81



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'





ACCESS ROAD 13 STA 23+00 - 0+00
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VERT: 1"=10'

100 0 100 200 300
FEET
Scale: 1"=100'

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REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
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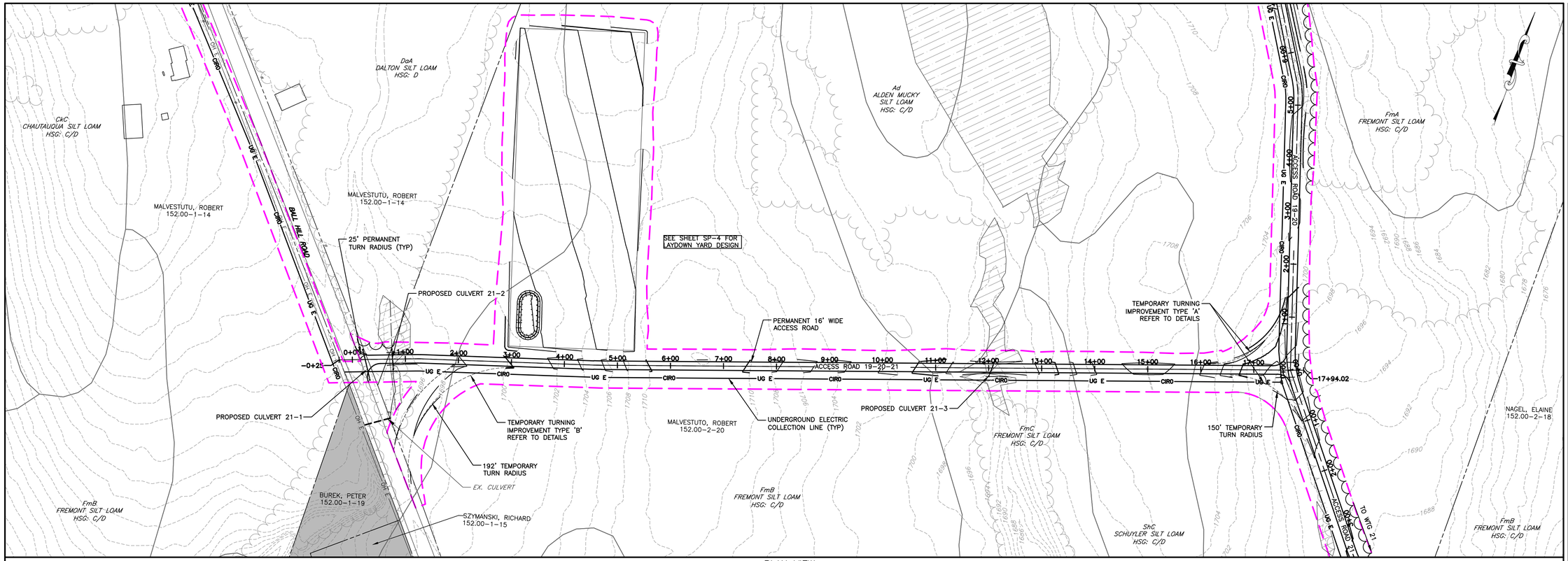
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 13 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-120

SHEET 27 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-120 - C-124.dwg
DATE/TIME: 10/14/2016 12:00:31 PM
USER: Steven Mellott



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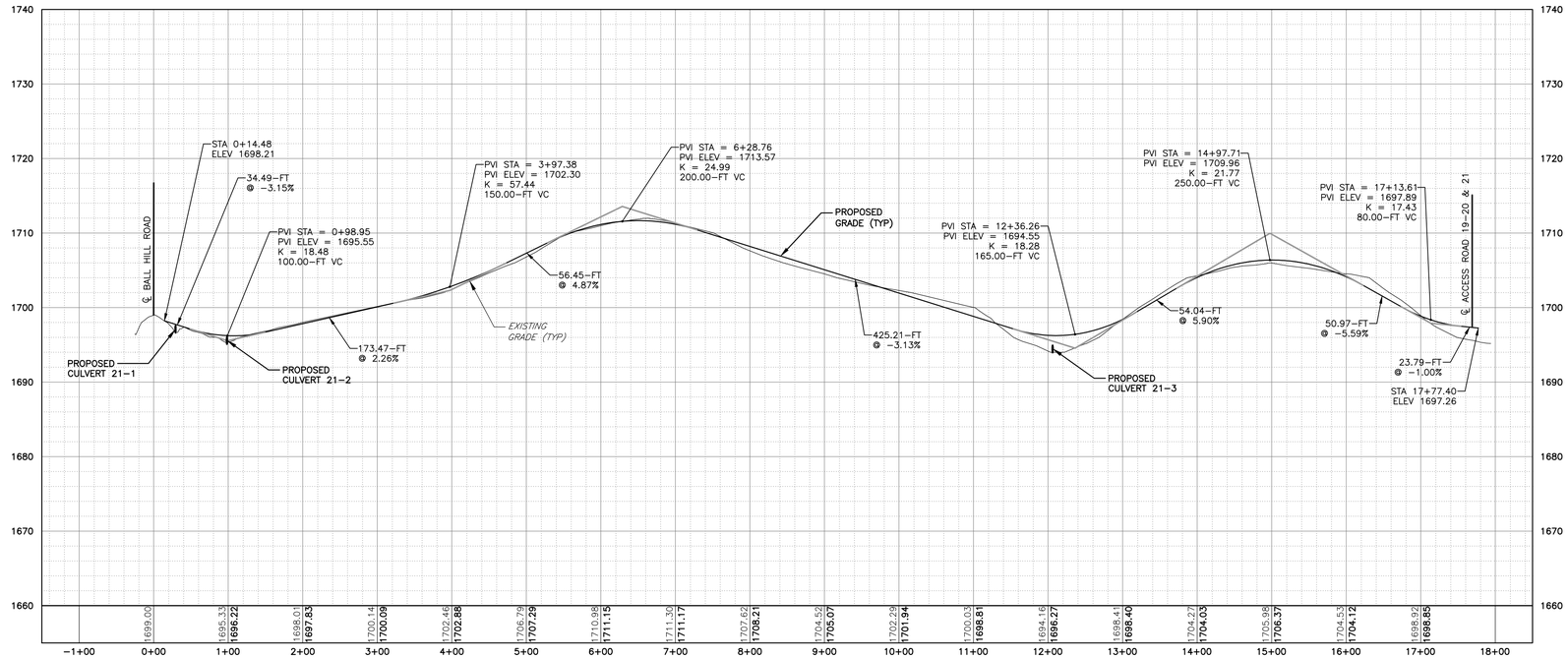
22X34 1"=100'



ACCESS ROAD TO 19 - 21
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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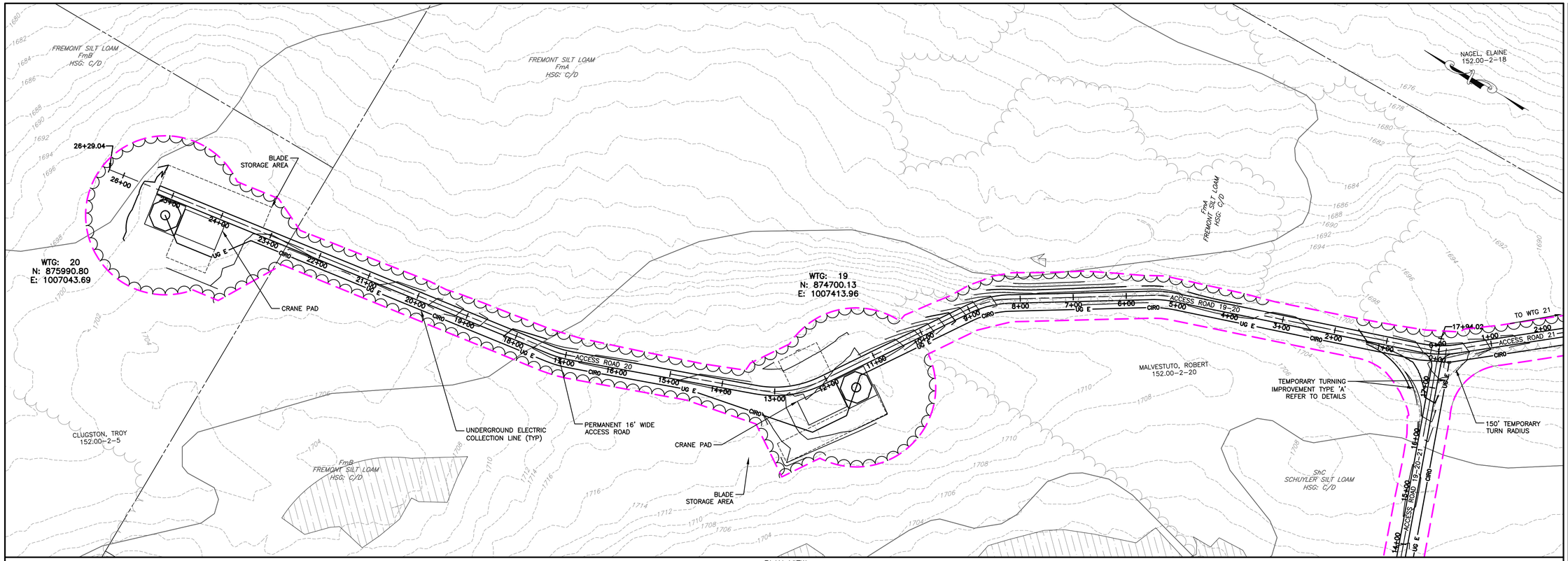
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 19 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-121

SHEET 28 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-120 - C-124.dwg
DATE/TIME: 10/14/2016 12:01:13 PM
USER: Steven Mellott



PLAN VIEW
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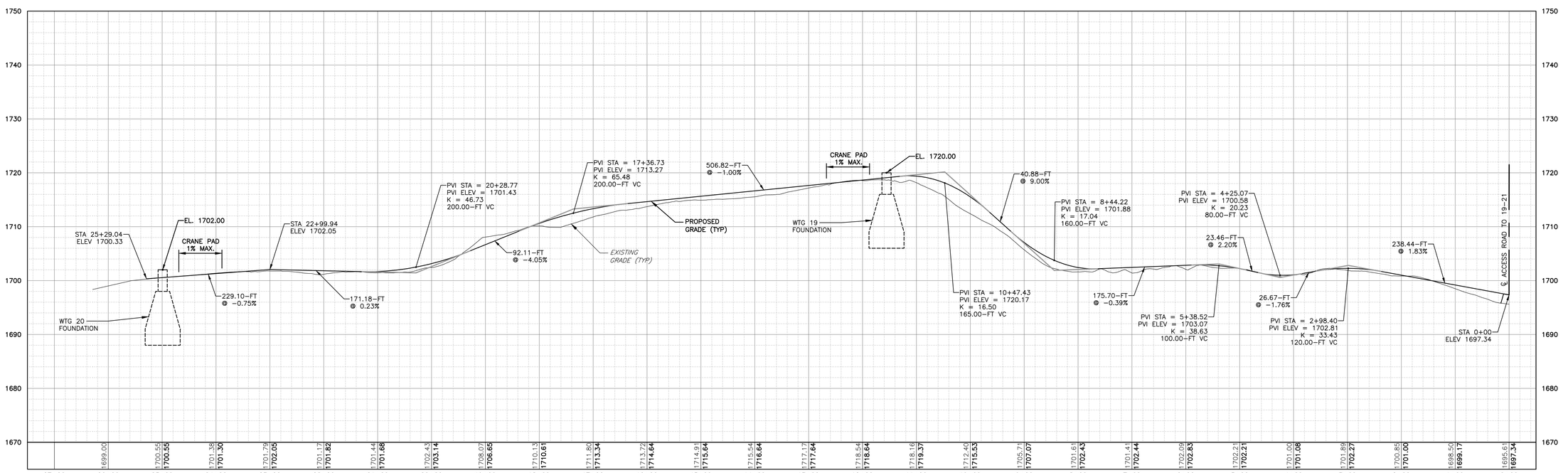
22X34 1"=100'



ACCESS ROAD 19-20 STA 26+00 – 0+00
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VERT: 1"=10'

100 0 100 200 300
FEET
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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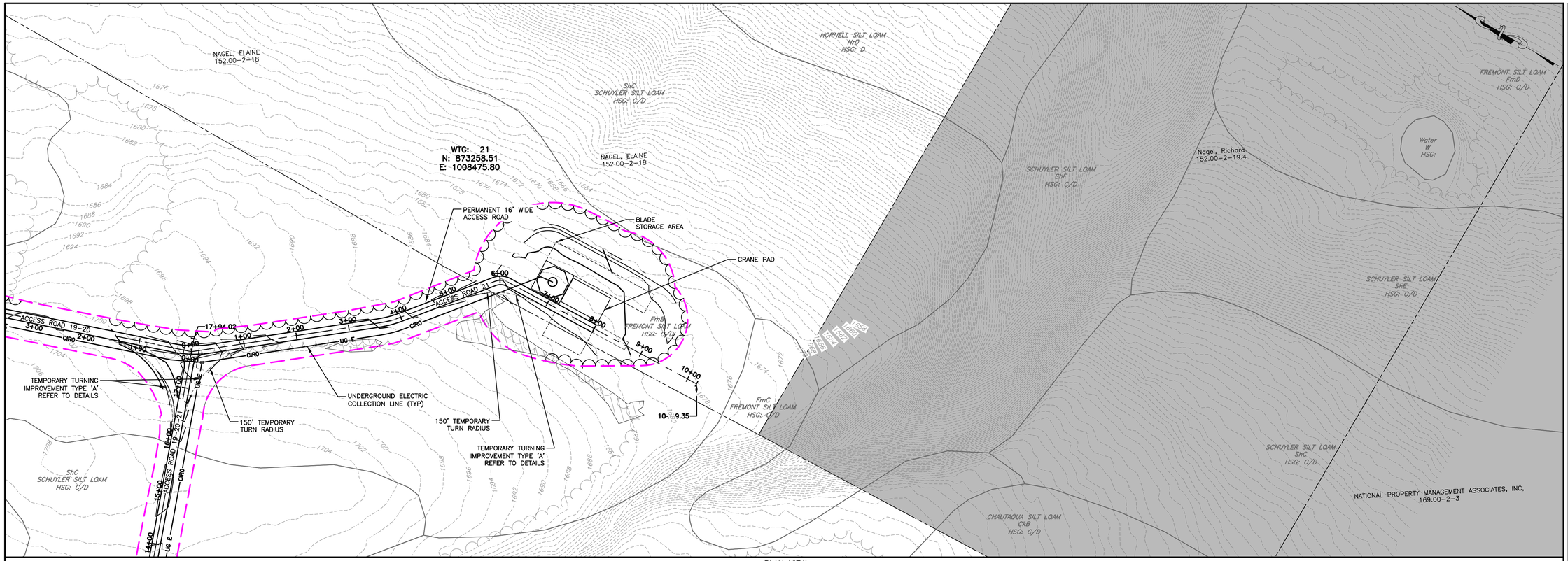
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 20 ACCESS RD PLAN & PROFILE

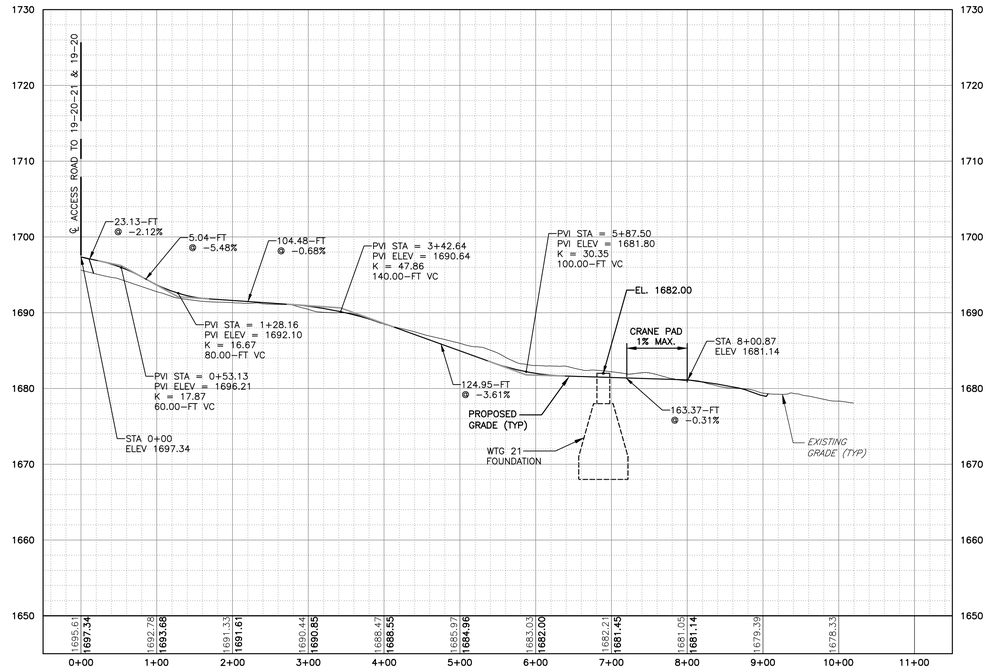
DRAWING NO.
C-122

SHEET 29 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-120 - C-124.dwg
DATE/TIME: 10/14/2016 12:01:52 PM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 21 PROFILE
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VERT: 1"=10'

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Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
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OCT. 2016

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CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 21 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-123

SHEET 30 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-120 - C-124.dwg
DATE/TIME: 10/14/2016 12:02:33 PM
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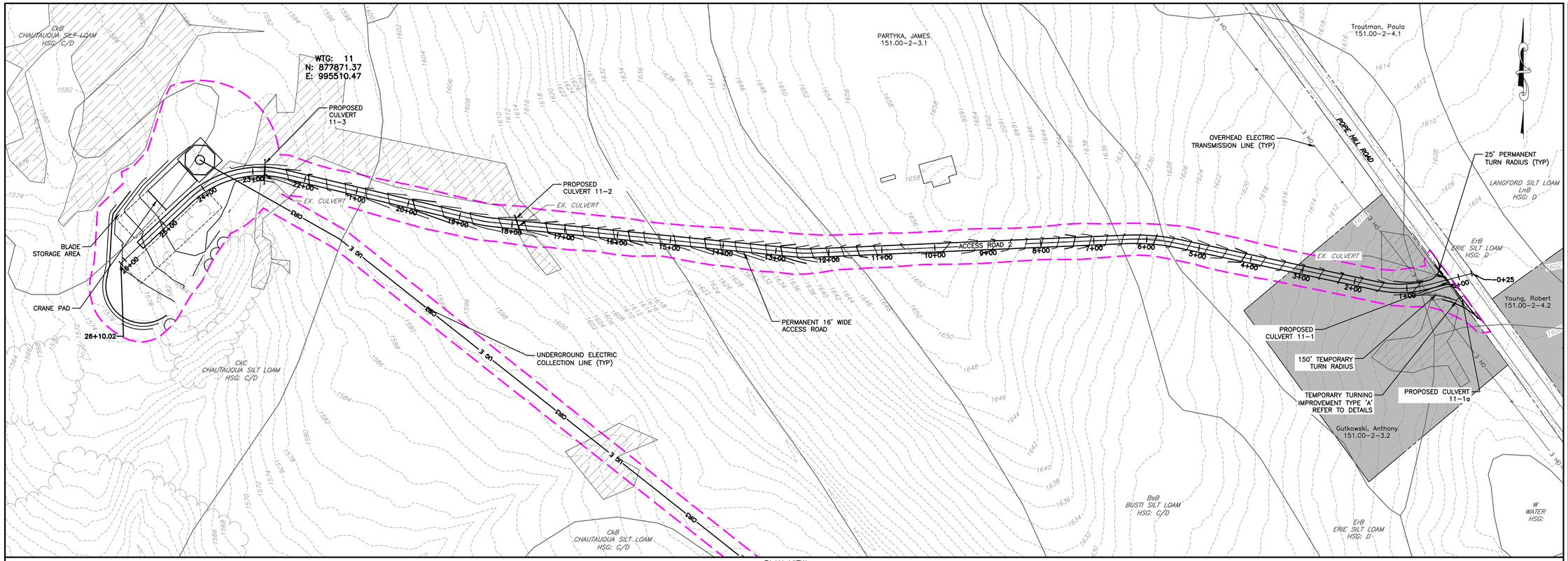

PLAN VIEW
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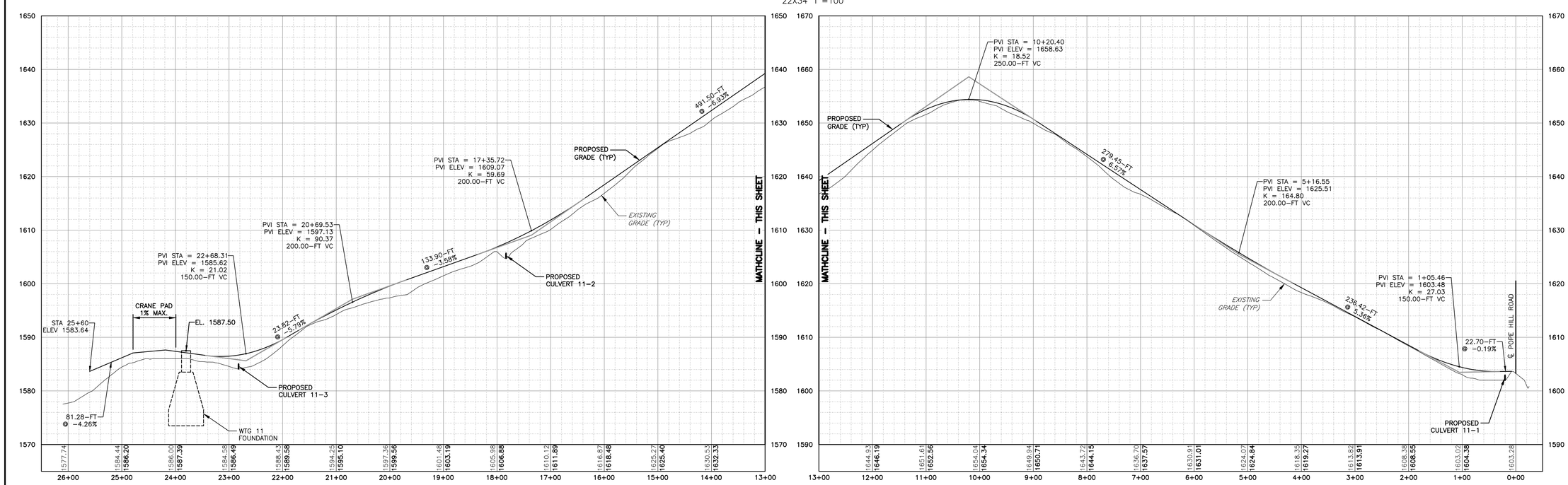
22X34 1"=100'



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FEET 100 0 100 200 300
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FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-120 - C-124.dwg
DATE/TIME: 10/14/2016 12:03:09 PM
USER: Steven Mellott

REV	DESCRIPTION	DATE	BY
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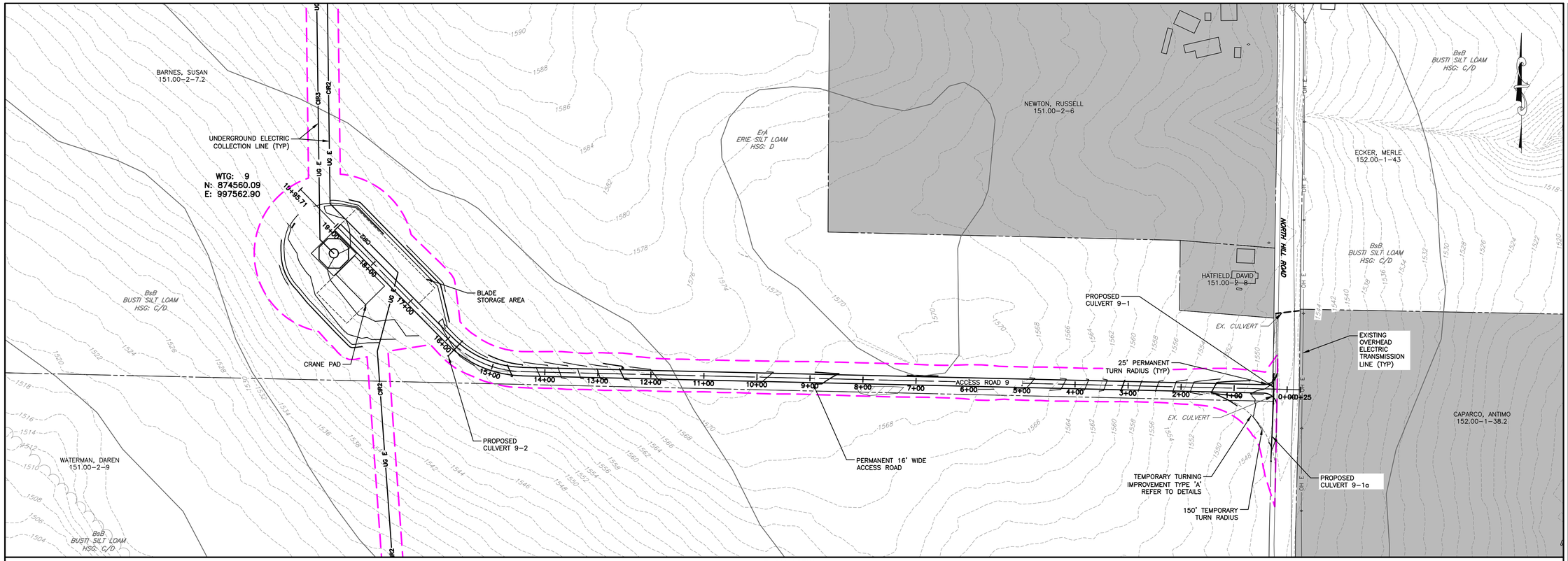
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

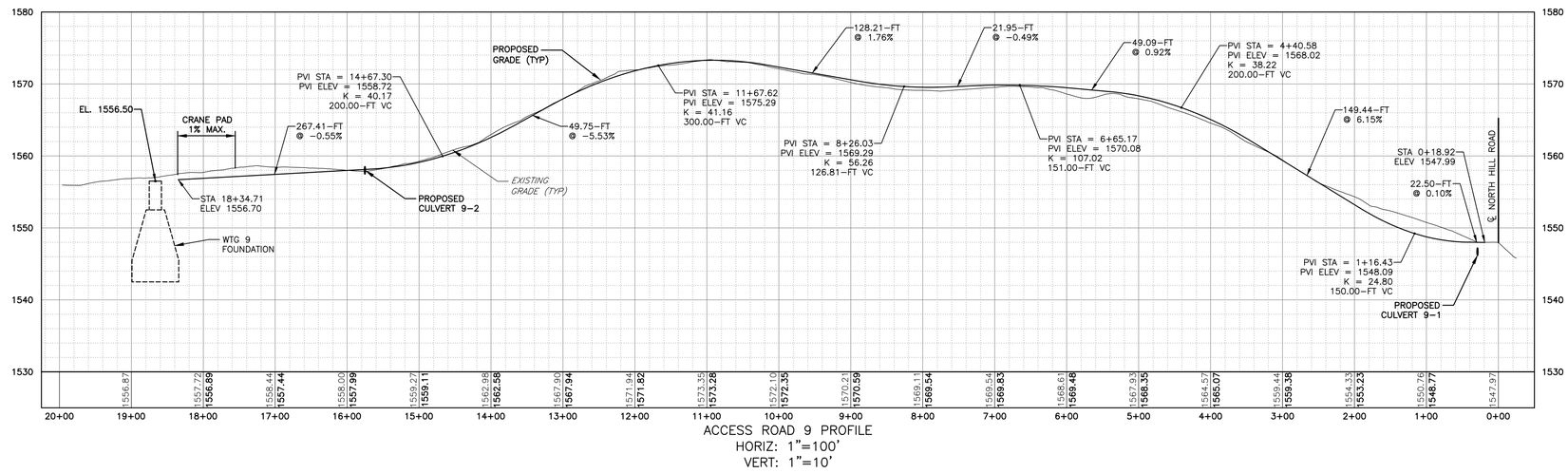
TITLE OF DRAWING
WTG 11 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-124

SHEET 31 OF 81



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 9 PROFILE
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Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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1	FILE LAYOUT UPDATES		

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OCT. 2016

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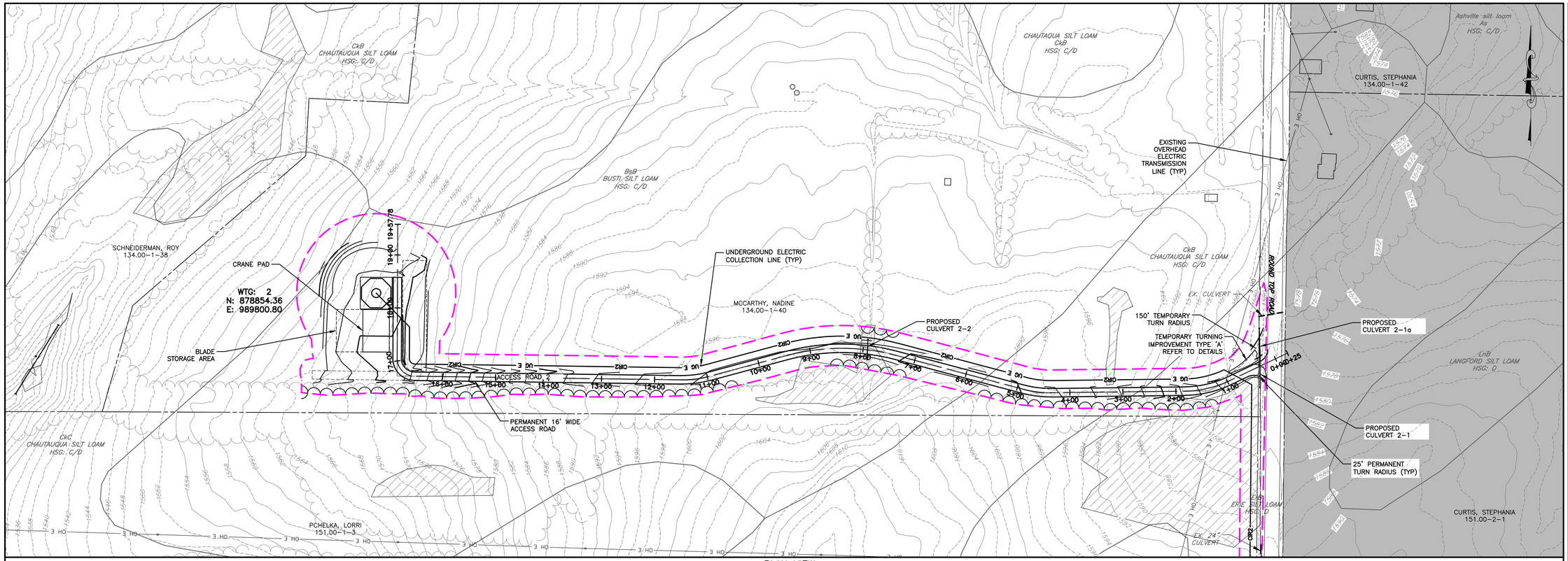
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 9 ACCESS RD PLAN & PROFILE

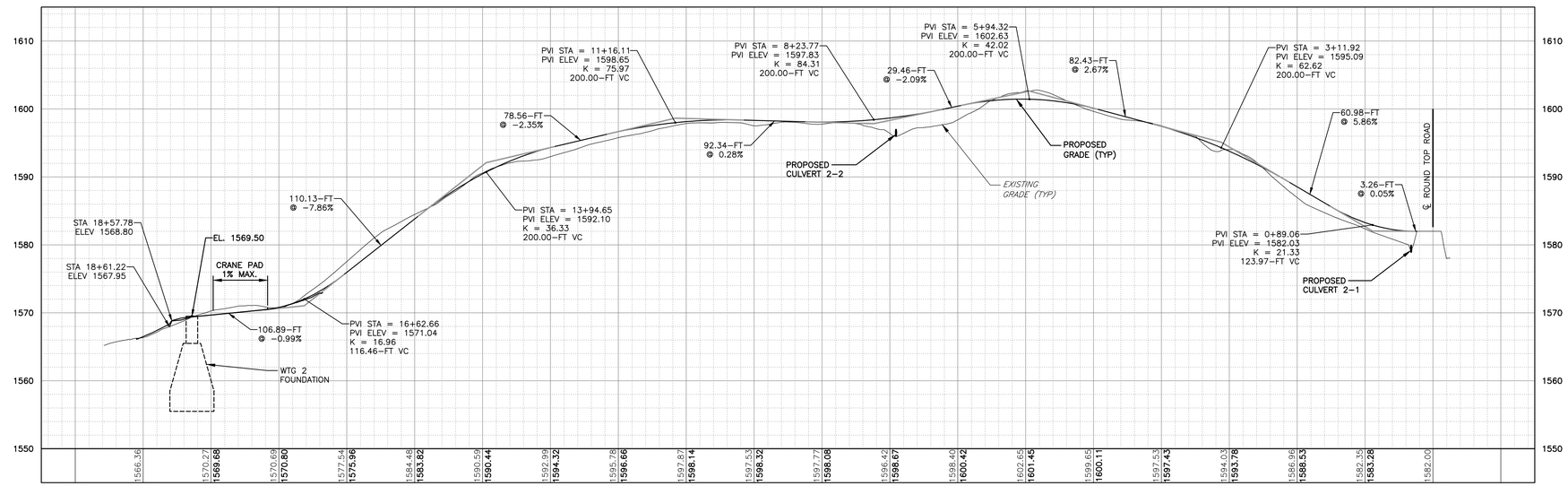
DRAWING NO.
C-125

SHEET 32 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-125 - C-129.dwg
DATE/TIME: 10/14/2016 12:05:17 PM
USER: Steven Mellott



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 2 PROFILE
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-125 - C-129.dwg
DATE/TIME: 10/14/2016 12:05:53 PM
USER: Steven Mellott

REV	DESCRIPTION	DATE	BY
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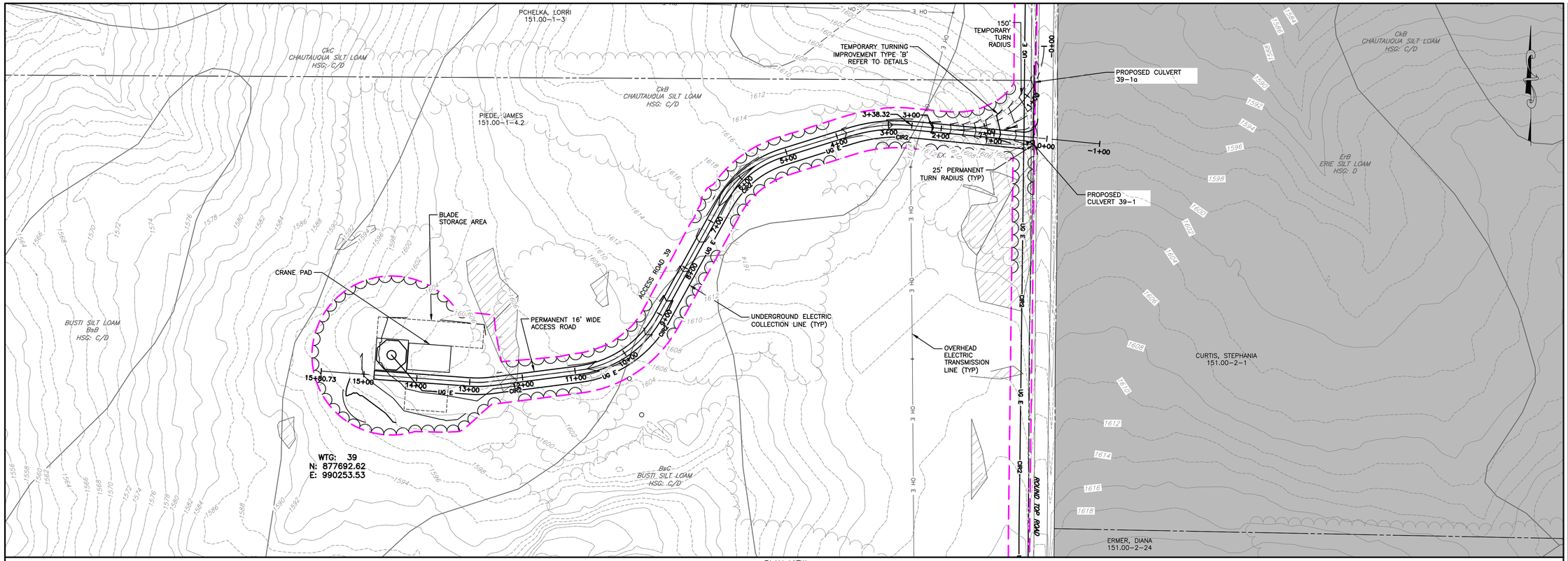
PRELIMINARY PLANS

TITLE OF DRAWING
WTG 2 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-126

SHEET 33 OF 81



PLAN VIEW
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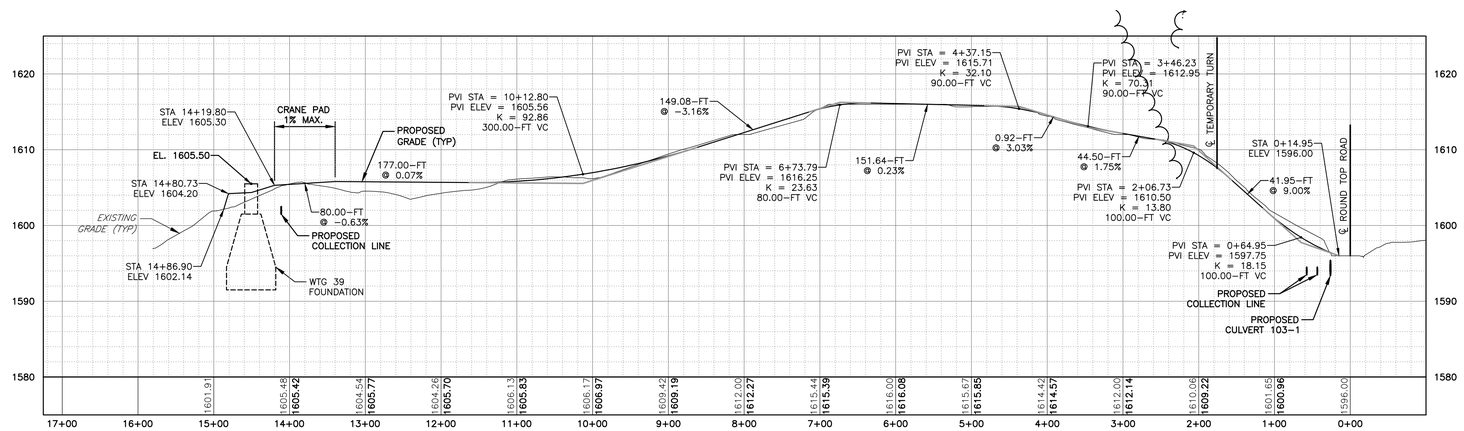
22X34 1"=100'



ACCESS ROAD 39 PROFILE
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

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1	FIELD LAYOUT		

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TITLE OF DRAWING
WTG 39 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-127

SHEET 34 OF 81

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DATE/TIME: 10/14/2016 12:06:29 PM
USER: Steven Mellott

PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'

ACCESS ROAD 8 STA 0+00 – 19+00
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
7			
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1	FILE LAYOUT UPDATES		

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PRELIMINARY PLANS

TITLE OF DRAWING
WTG 8 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-128

SHEET 35 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-125 - C-129.dwg
DATE/TIME: 10/14/2016 12:07:04 PM
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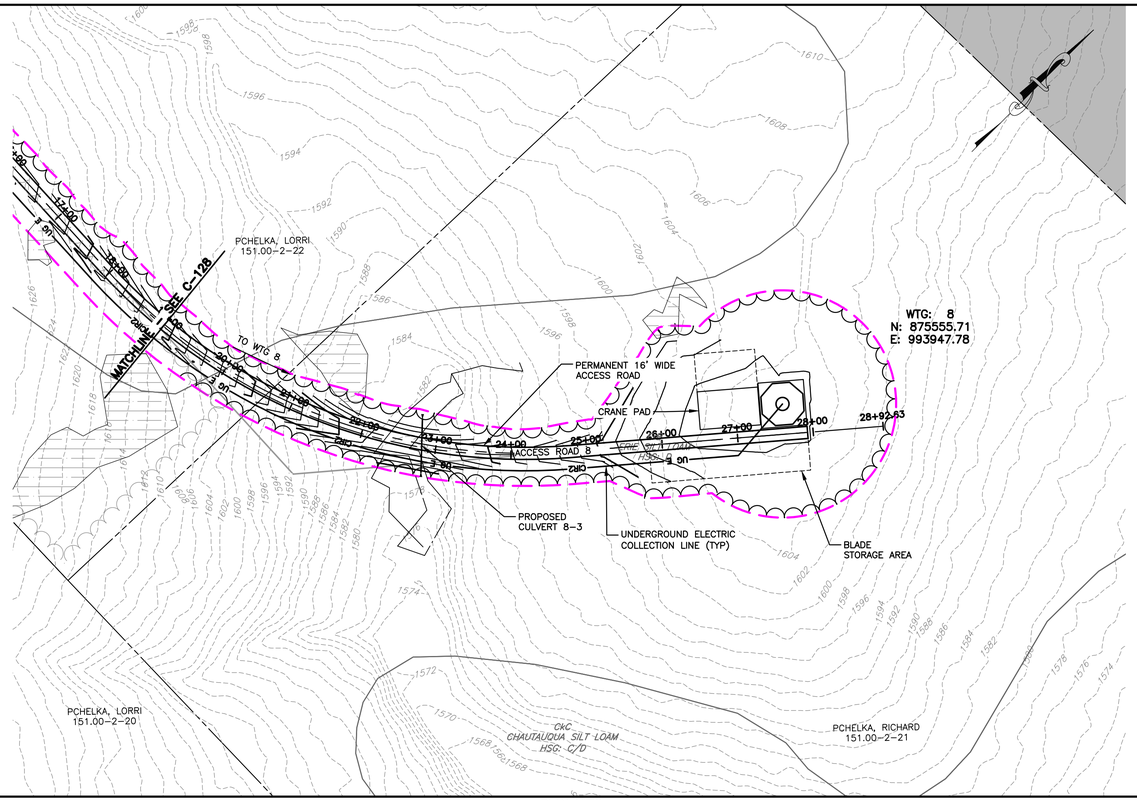

PLAN VIEW
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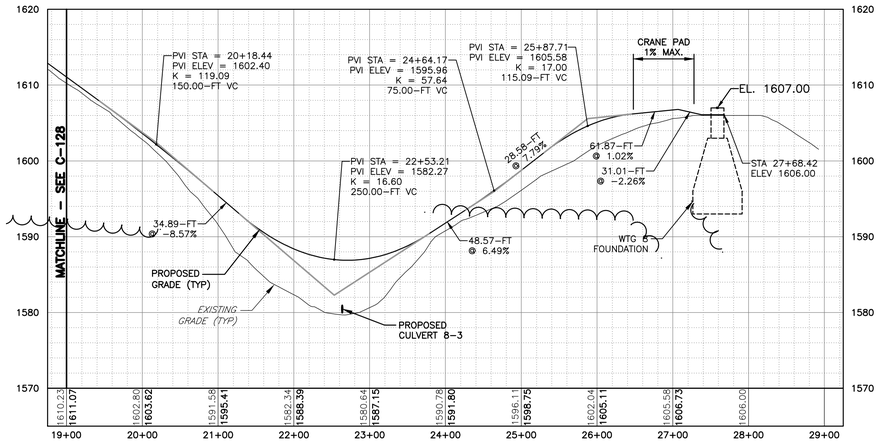
22X34 1"=100'



ACCESS ROAD 8 STA 19+00 – 29+00
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

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PRELIMINARY PLANS

TITLE OF DRAWING
WTG 8 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-129

SHEET 36 OF 81

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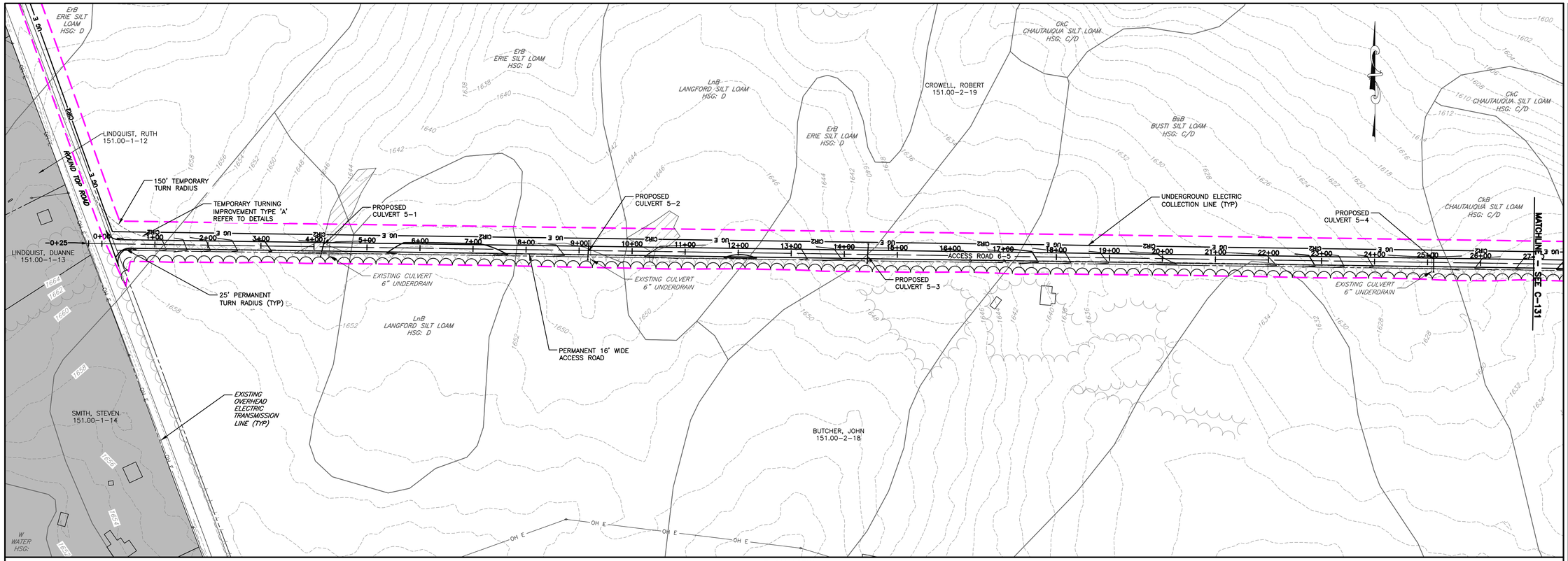

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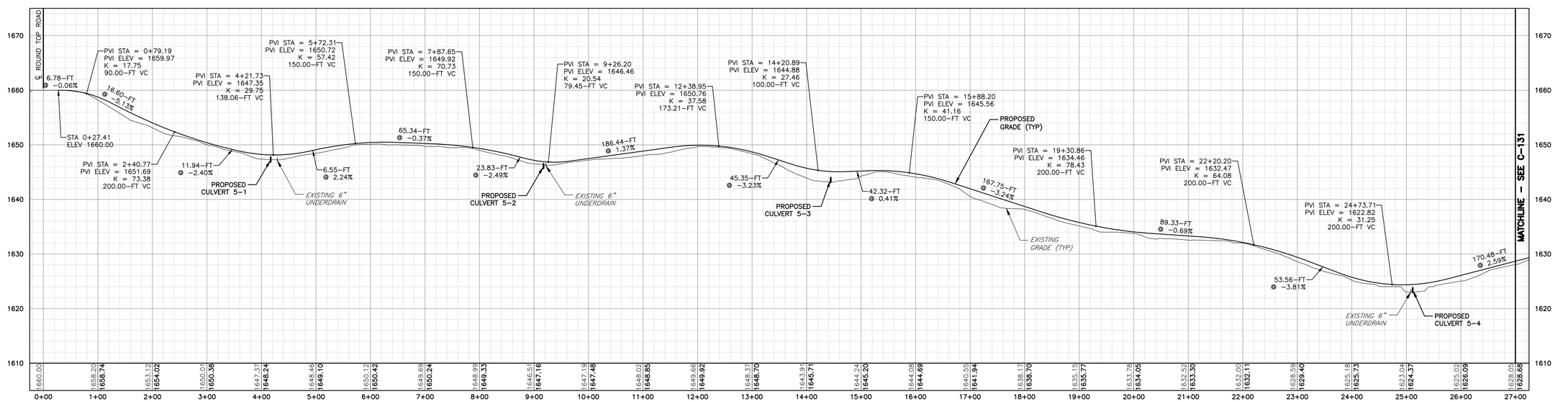
22X34 1"=100'



ACCESS ROAD 6-5 STA 0+00 - 27+00
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

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PRELIMINARY PLANS

TITLE OF DRAWING
WTG 7 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-130

SHEET 37 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-130 - C-134.dwg
DATE/TIME: 10/14/2016 12:09:46 PM
USER: Steven Mellott

EATON, WILLIAM
168.00-1-42

CLARKE, BETTY
151.00-2-17

TENEREWICZ, DANIEL
168.00-1-43

BLADE
STORAGE AREA

CRANE PAD

TO WTG 5

MATCHLINE – SEE C-132

WTG: 6
N: 871961.38
E: 995565.46

PERMANENT 16' WIDE
ACCESS ROAD

CkB
CHAUTAUQUA SILT LOAM
HSG: C/D

BUTCHER, JOHN
151.00-2-18

CkC
CHAUTAUQUA SILT LOAM
HSG: C/D

16' TEMPORARY
ACCESS ROAD

MATCHLINE – SEE C-130

TEMPORARY TURNING
IMPROVEMENT TYPE 'A'
REFER TO DETAILS

CROWELL, ROBERT
151.00-2-19

150' TEMPORARY
TURN RADIUS

ErB
ERIE SILT LOAM
HSG: D

WTG: 7
N: 873875.10
E: 994986.42

CkC
CHAUTAUQUA SILT LOAM
HSG: C/D

CRANE PAD

PCHELKA, LORRI
151.00-2-20

As
ASHVILLE SILT LOAM
HSG: C/D

PROPOSED
CULVERT 5-5

25' PERMANENT
TURN RADIUS (TYP)

PROPOSED
CULVERT 7-1

WATERMAN, DAREN
151.00-2-9

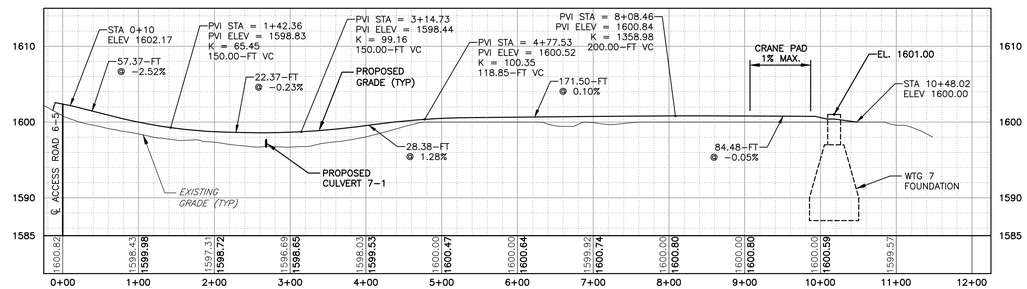
UNDERGROUND ELECTRIC
COLLECTION LINE (TYP)

CROWELL FAMILY HOLDINGS, LLC,
151.00-2-15

CROWELL FAMILY HOLDINGS, LLC,
151.00-2-15

BsB
BUSTI SILT LOAM
HSG: C/D

PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



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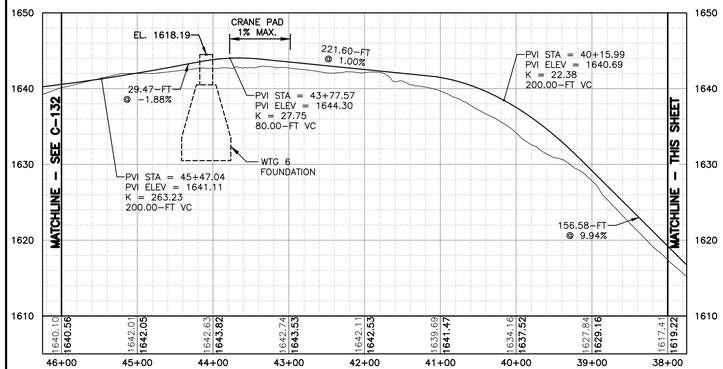

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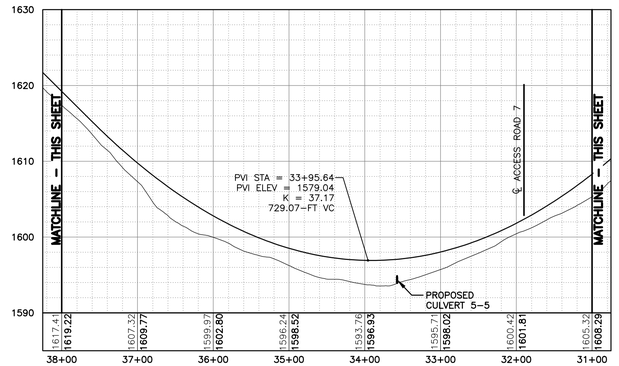

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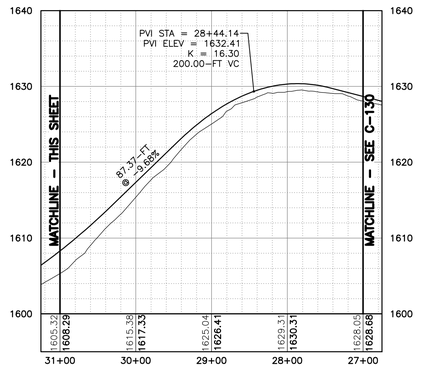

ACCESS ROAD 6-5 STA 27+00 – 31+00
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VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 C-130 - C-134.dwg
DATE/TIME: 10/14/2016 12:11:06 PM
USER: Steven Mellott

REV	DESCRIPTION	DATE	BY
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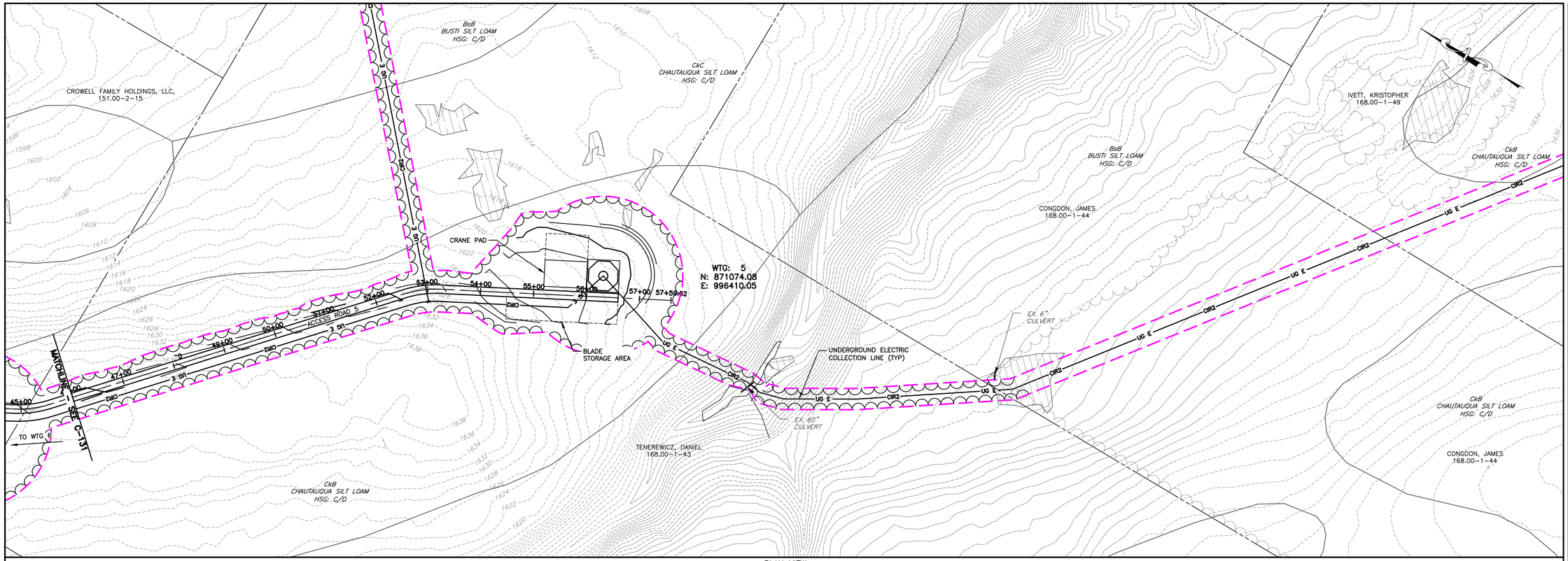
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

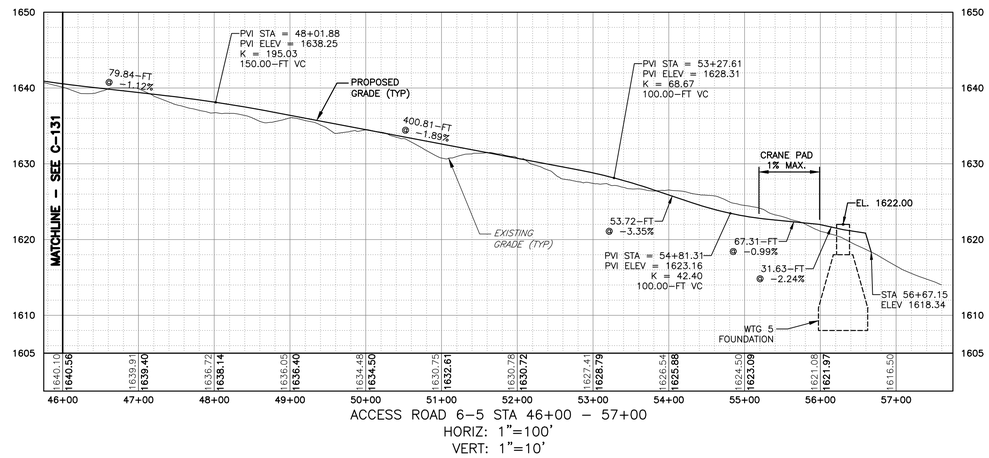
TITLE OF DRAWING
WTG 7 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-131

SHEET 38 OF 81



PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



ACCESS ROAD 6-5 STA 46+00 - 57+00
HORIZ: 1"=100'
VERT: 1"=10'

100 FEET 0 100 200 300
Scale: 1"=100'

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TITLE OF DRAWING
WTG 5 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-132

SHEET 39 OF 81

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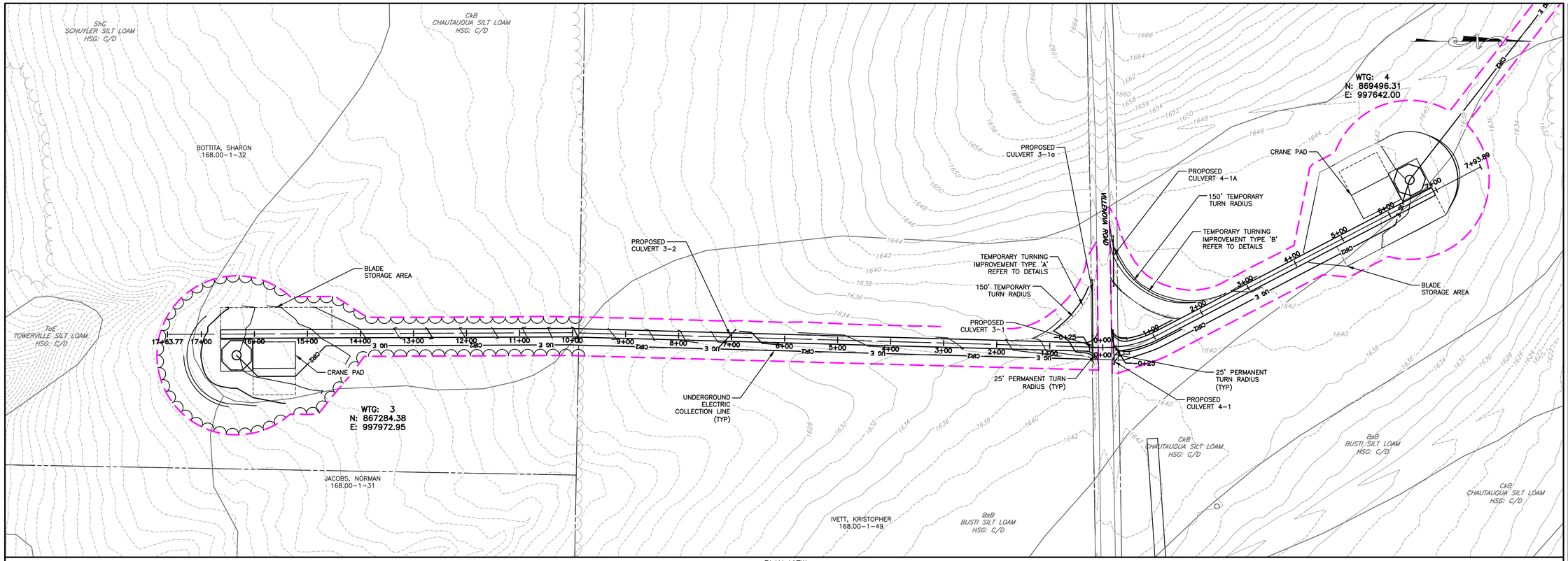
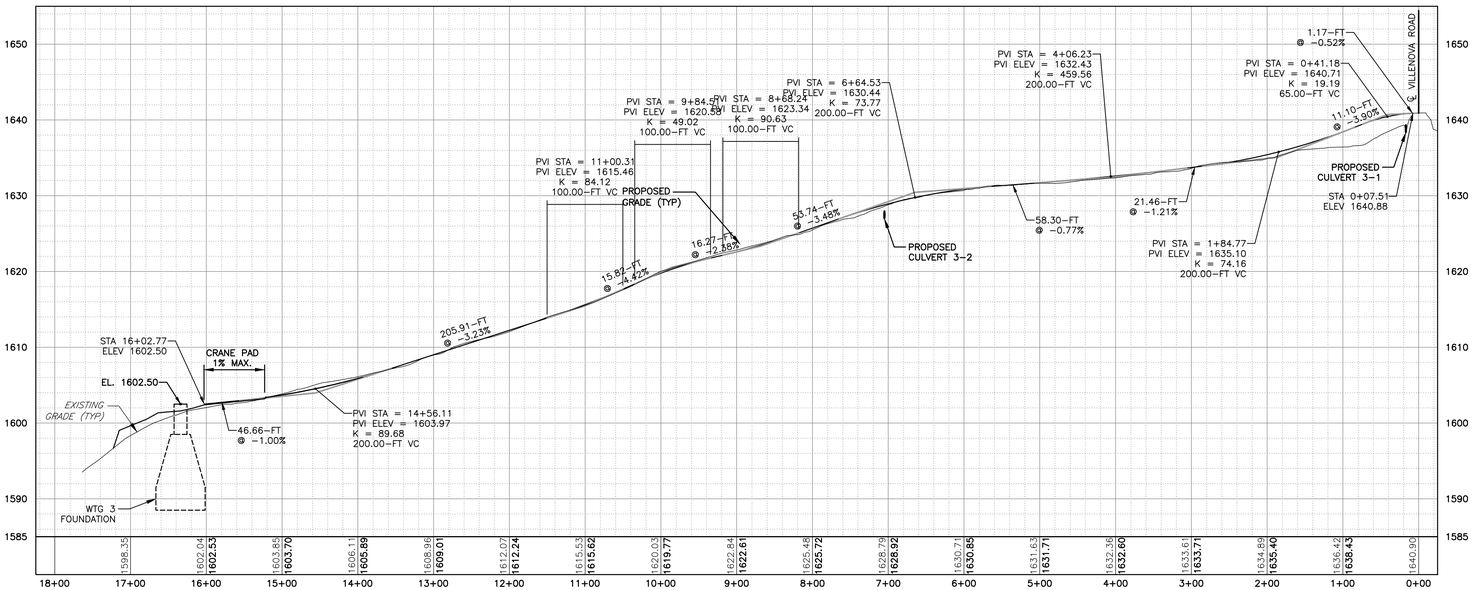


PLAN VIEW
SCALE: 11X17 1"=200'
22X34 1"=100'



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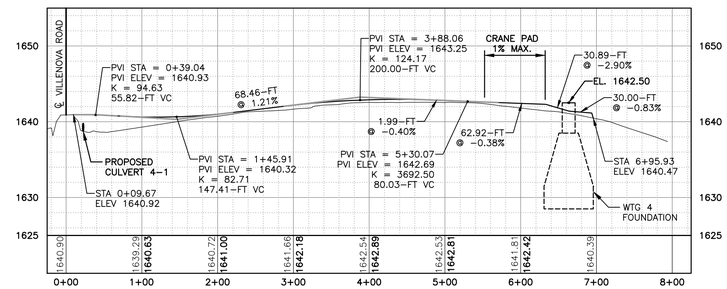

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Scale: 1"=100'

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USER: Steven Mellott

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CHAUTAUQUA COUNTY, NY
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TITLE OF DRAWING
WTG 3 ACCESS RD PLAN & PROFILE

DRAWING NO.
C-133

SHEET 40 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 IND-R index plan sheet.dwg
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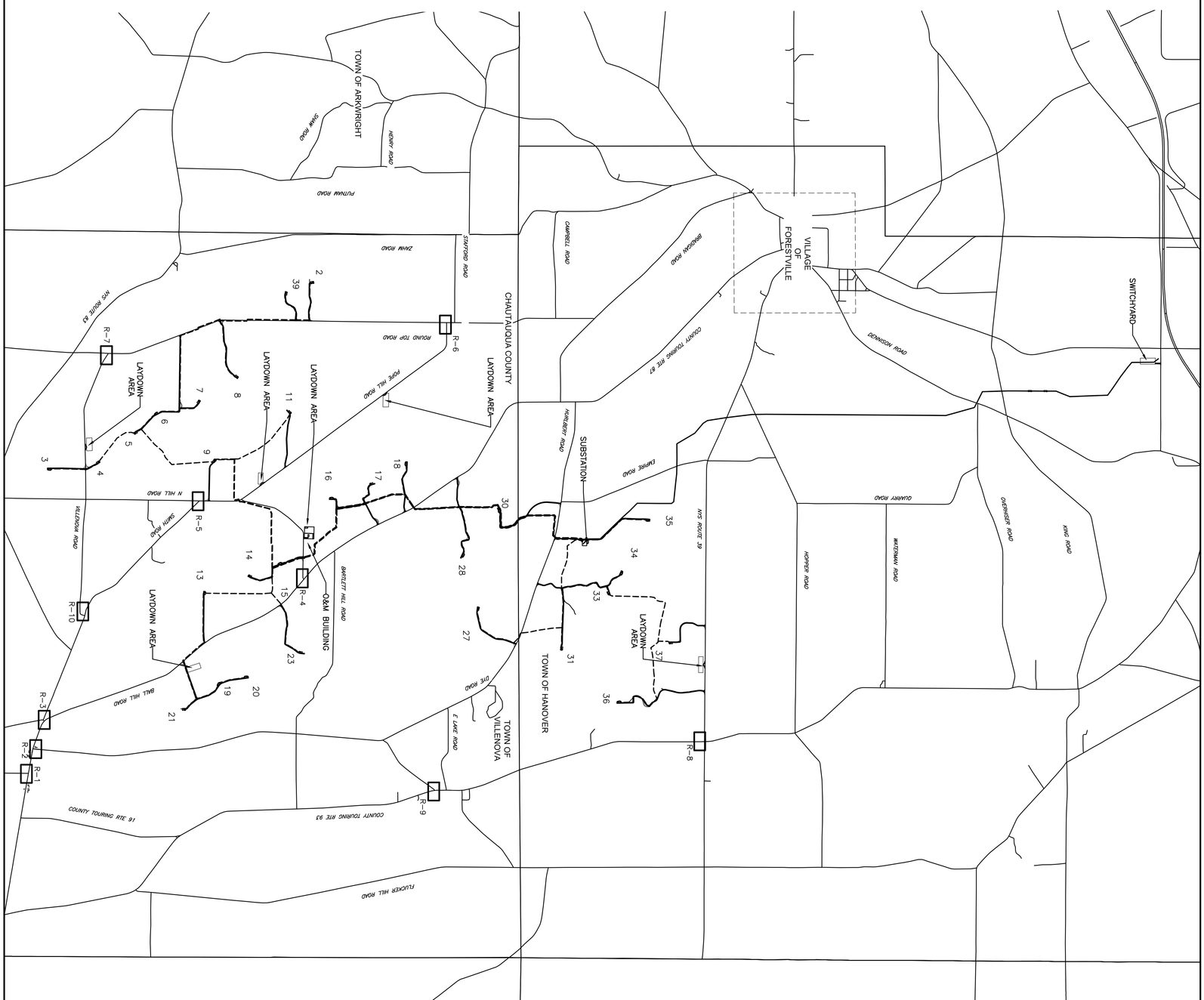

Scale: 1"=1500'
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DRAWING NO.
IND-R

SHEET 41 OF 81

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
PUBLIC INTERSECTION IMPROVEMENT INDEX

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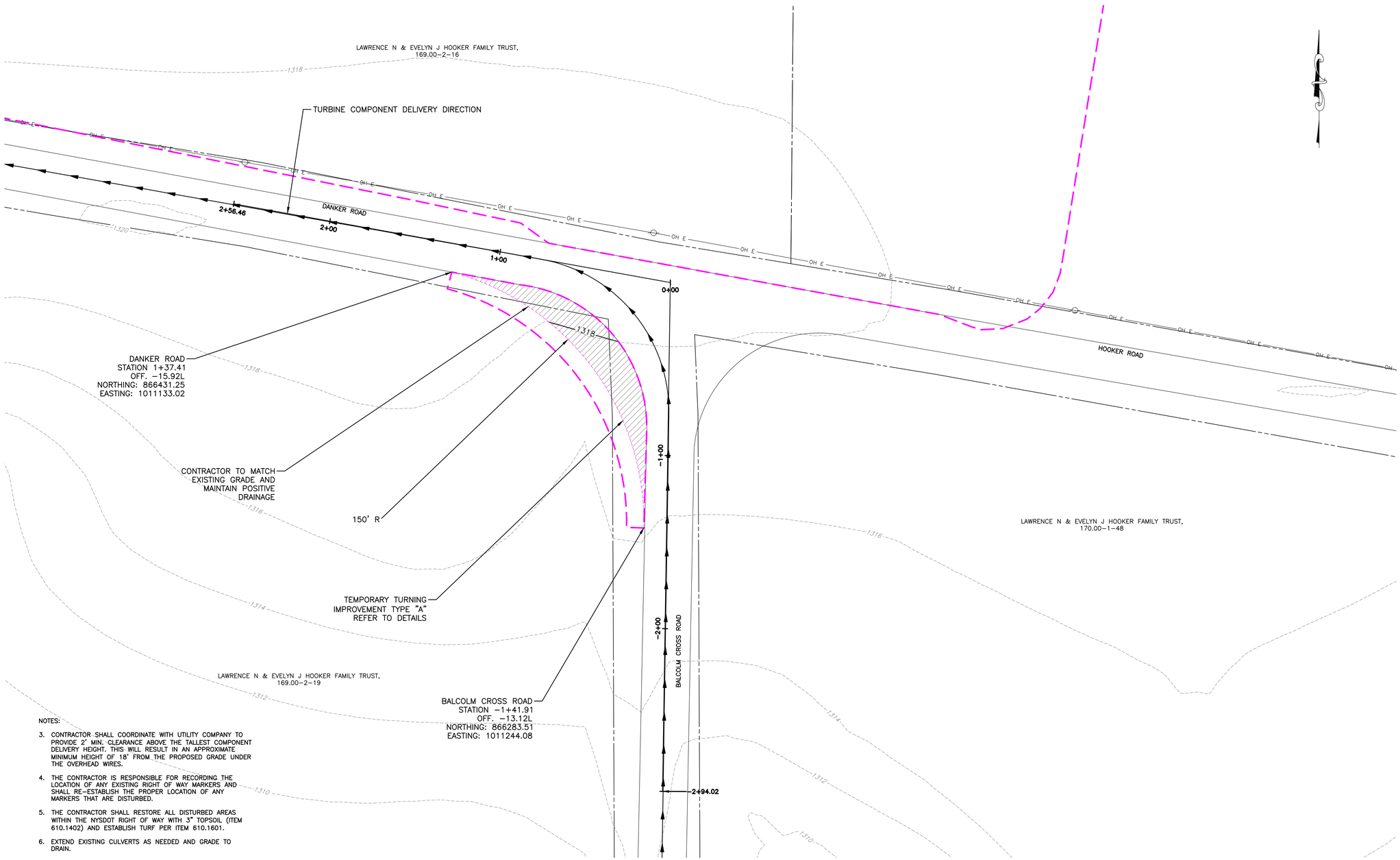

NOTES:

3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY TO PROVIDE 2' MIN. CLEARANCE ABOVE THE TALLEST COMPONENT DELIVERY HEIGHT. THIS WILL RESULT IN AN APPROXIMATE MINIMUM HEIGHT OF 18' FROM THE PROPOSED GRADE UNDER THE OVERHEAD WIRES.
4. THE CONTRACTOR IS RESPONSIBLE FOR RECORDING THE LOCATION OF ANY EXISTING RIGHT OF WAY MARKERS AND SHALL RE-ESTABLISH THE PROPER LOCATION OF ANY MARKERS THAT ARE DISTURBED.
5. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITHIN THE NYSDOT RIGHT OF WAY WITH 3" TOPSOIL (ITEM 610.1402) AND ESTABLISH TURF PER ITEM 610.1601.
6. EXTEND EXISTING CULVERTS AS NEEDED AND GRADE TO DRAIN.

BALCOLM CROSS RD & DANKER RD INTERSECTION IMPROVEMENT
PLAN VIEW

SCALE: 11X17 1"=60'
22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 R-1_R-3 intersection improvement.dwg
DATE/TIME: 10/14/2016 12:15:00 PM
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
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SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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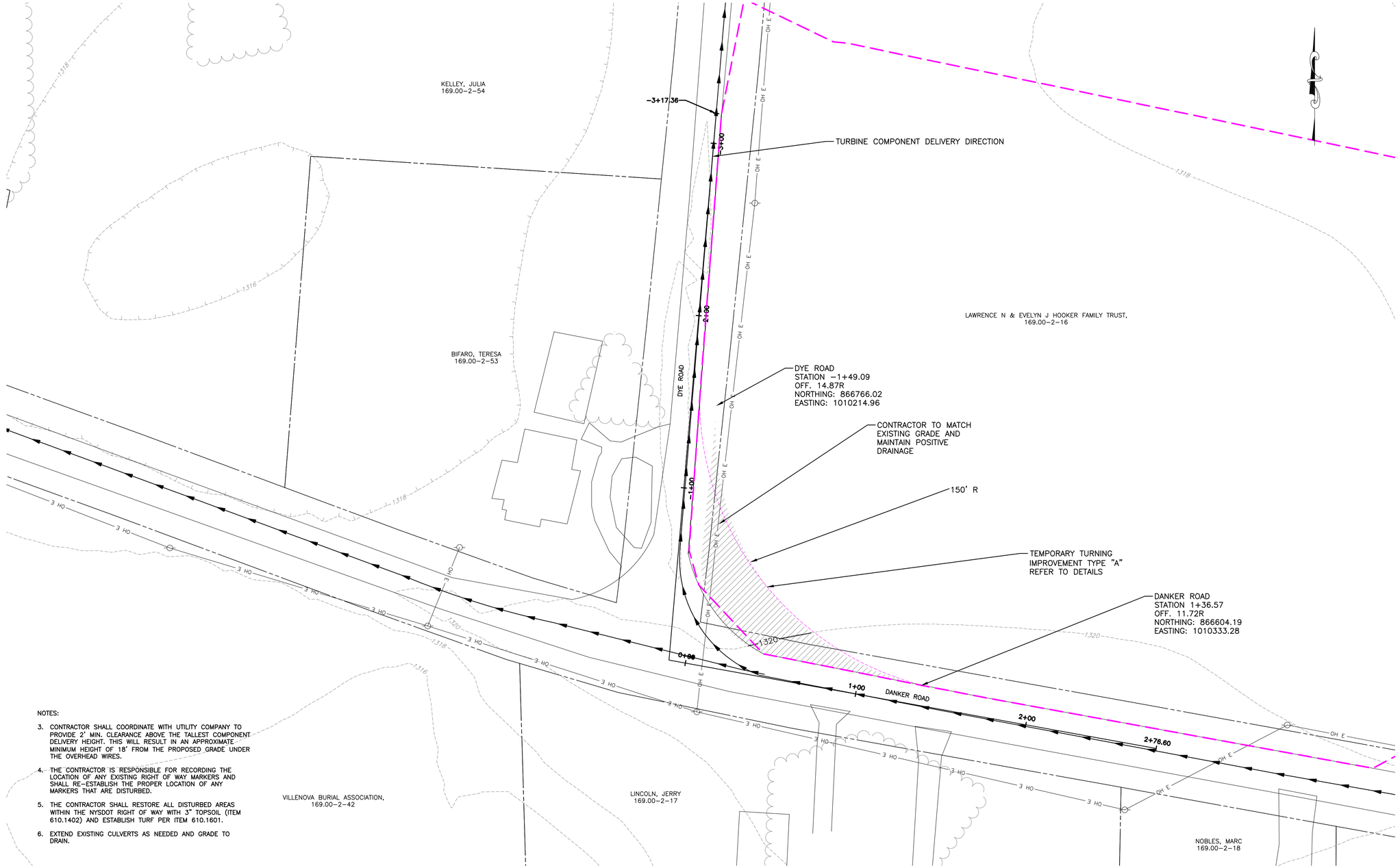
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
BALCOLM CROSS RD & DANKER RD INTERSECTION IMPROVEMENT

DRAWING NO.
R-1



NOTES:

3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY TO PROVIDE 2' MIN. CLEARANCE ABOVE THE TALLEST COMPONENT DELIVERY HEIGHT. THIS WILL RESULT IN AN APPROXIMATE MINIMUM HEIGHT OF 18' FROM THE PROPOSED GRADE UNDER THE OVERHEAD WIRES.
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5. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITHIN THE NYSDOT RIGHT OF WAY WITH 3" TOPSOIL (ITEM 610.1402) AND ESTABLISH TURF PER ITEM 610.1601.
6. EXTEND EXISTING CULVERTS AS NEEDED AND GRADE TO DRAIN.

DYE RD & DANKER RD INTERSECTION IMPROVEMENT
PLAN VIEW

SCALE: 11X17 1"=60'
22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

REV	DESCRIPTION	DATE	BY
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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
DYE RD & DANKER RD INTERSECTION IMPROVEMENT

DRAWING NO.
R-2

SHEET 43 OF 81

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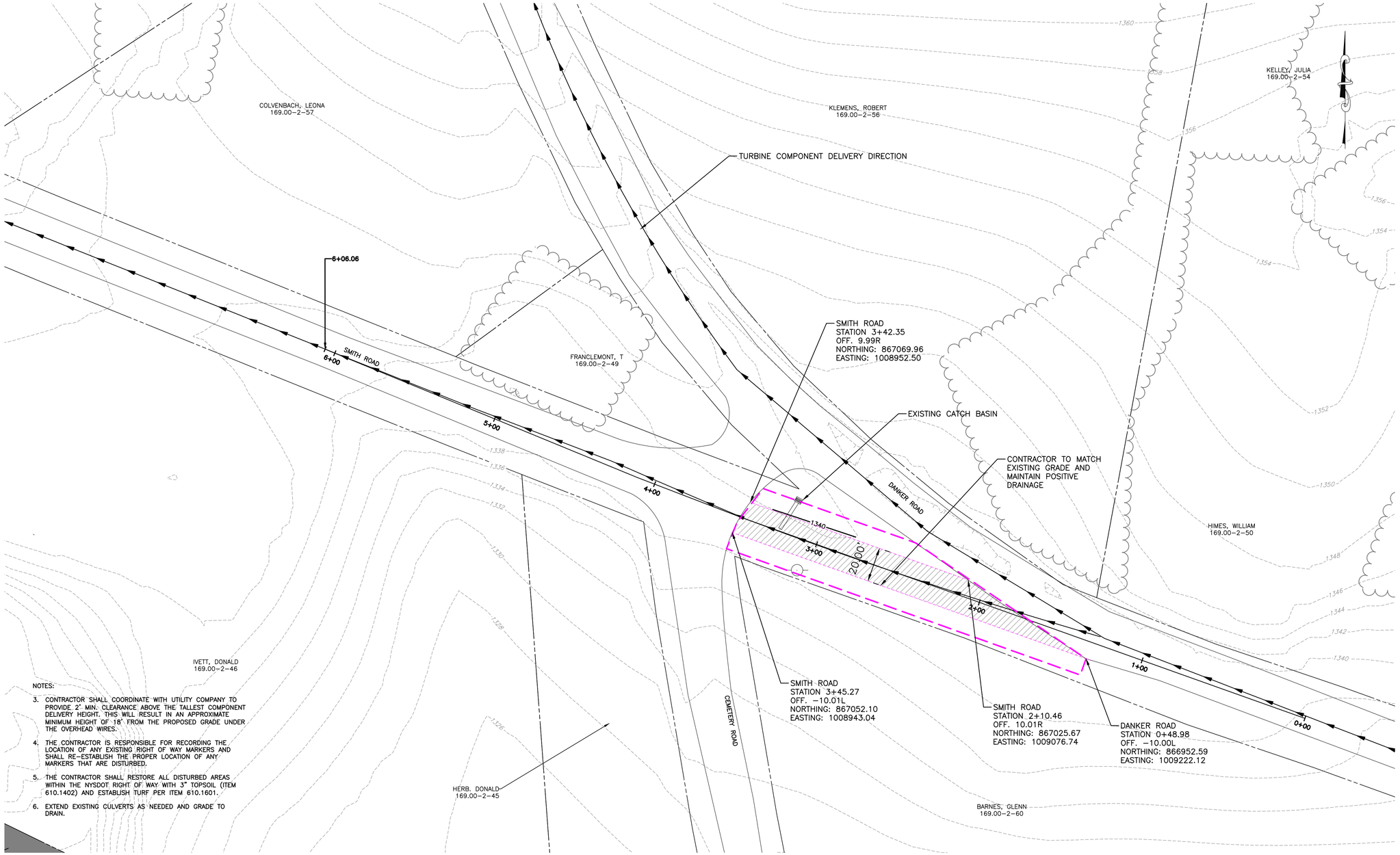

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6. EXTEND EXISTING CULVERTS AS NEEDED AND GRADE TO DRAIN.

DANKER RD & SMITH RD INTERSECTION IMPROVEMENT
PLAN VIEW

SCALE: 11X17 1"=60'
22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

REV	DESCRIPTION	DATE	BY
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PROJECT
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TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
DANKER RD & SMITH RD INTERSECTION IMPROVEMENT

FA PROJECT NO.
150001

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AS SHOWN

ISSUE DATE
OCT. 2016

DRAWING NO.
R-3

SHEET 44 OF 81

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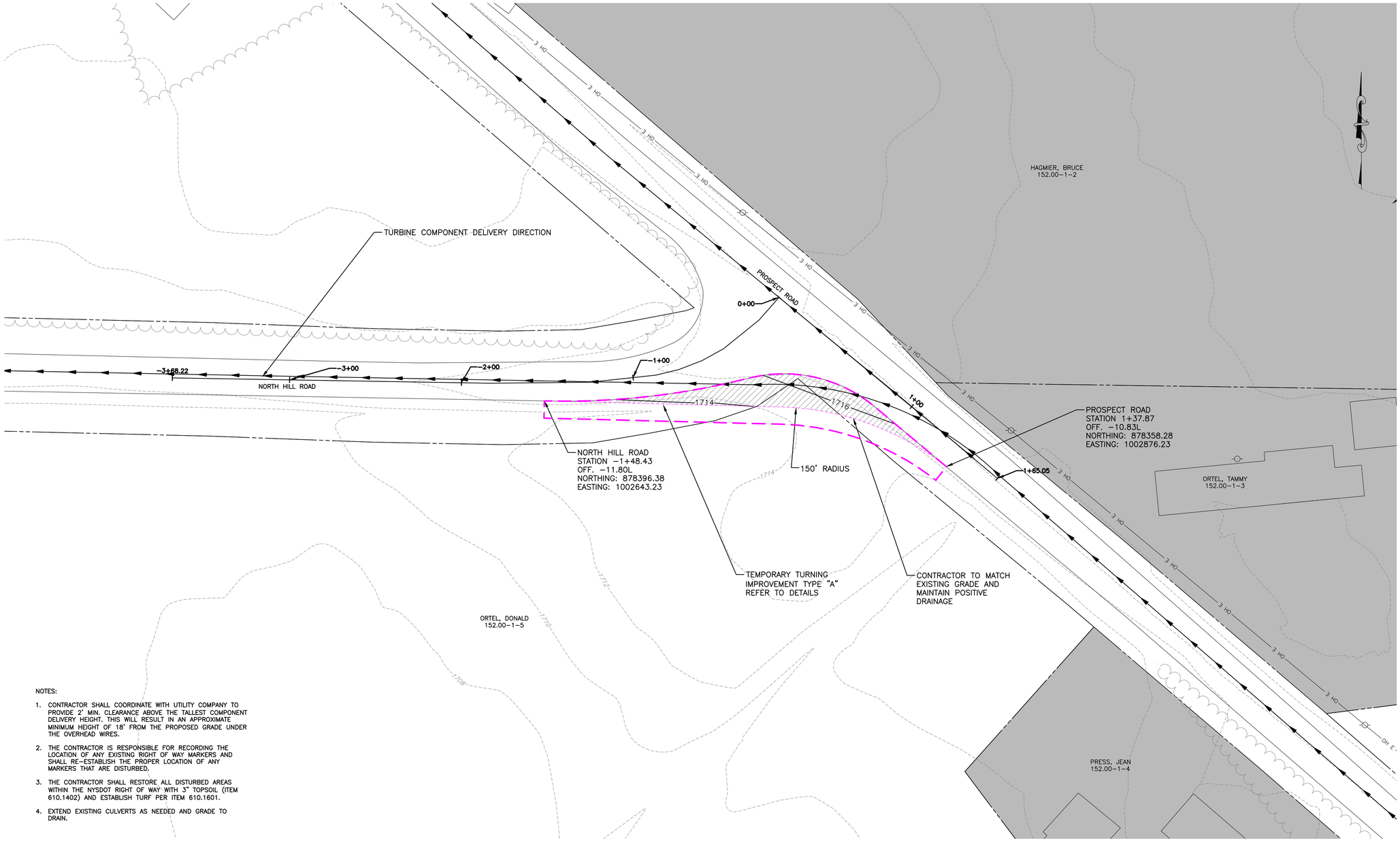

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PROSPECT RD & NORTH HILL RD INTERSECTION IMPROVEMENT
PLAN VIEW
SCALE: 22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
PROSPECT RD & NORTH HILL RD INTERSECTION IMPROVEMENT

DRAWING NO.
R-4

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 R-4_R-7 intersection improvement.dwg
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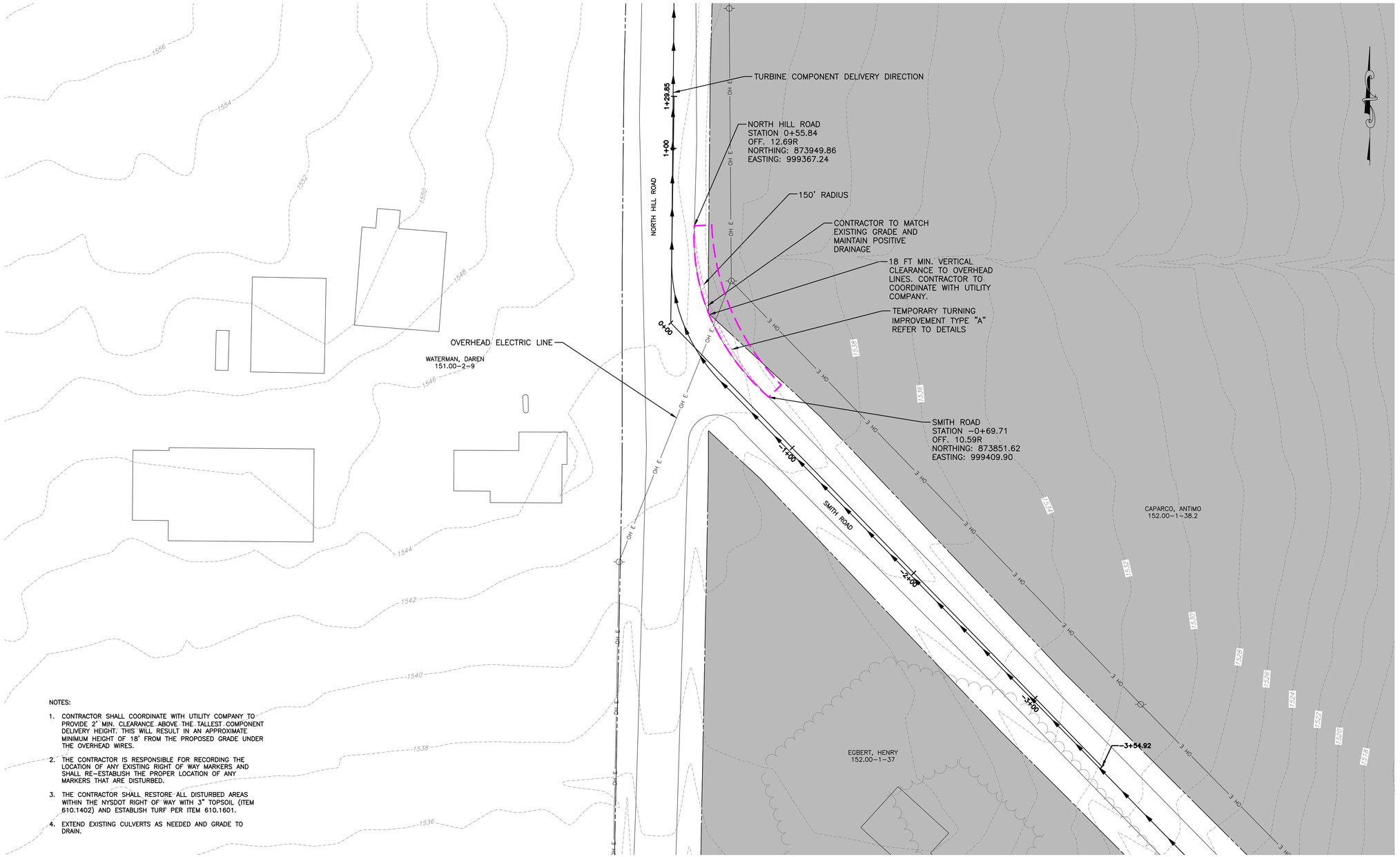

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NORTH HILL RD & SMITH RD INTERSECTION IMPROVEMENT
PLAN VIEW
SCALE: 22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

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USER: Steven Mellott

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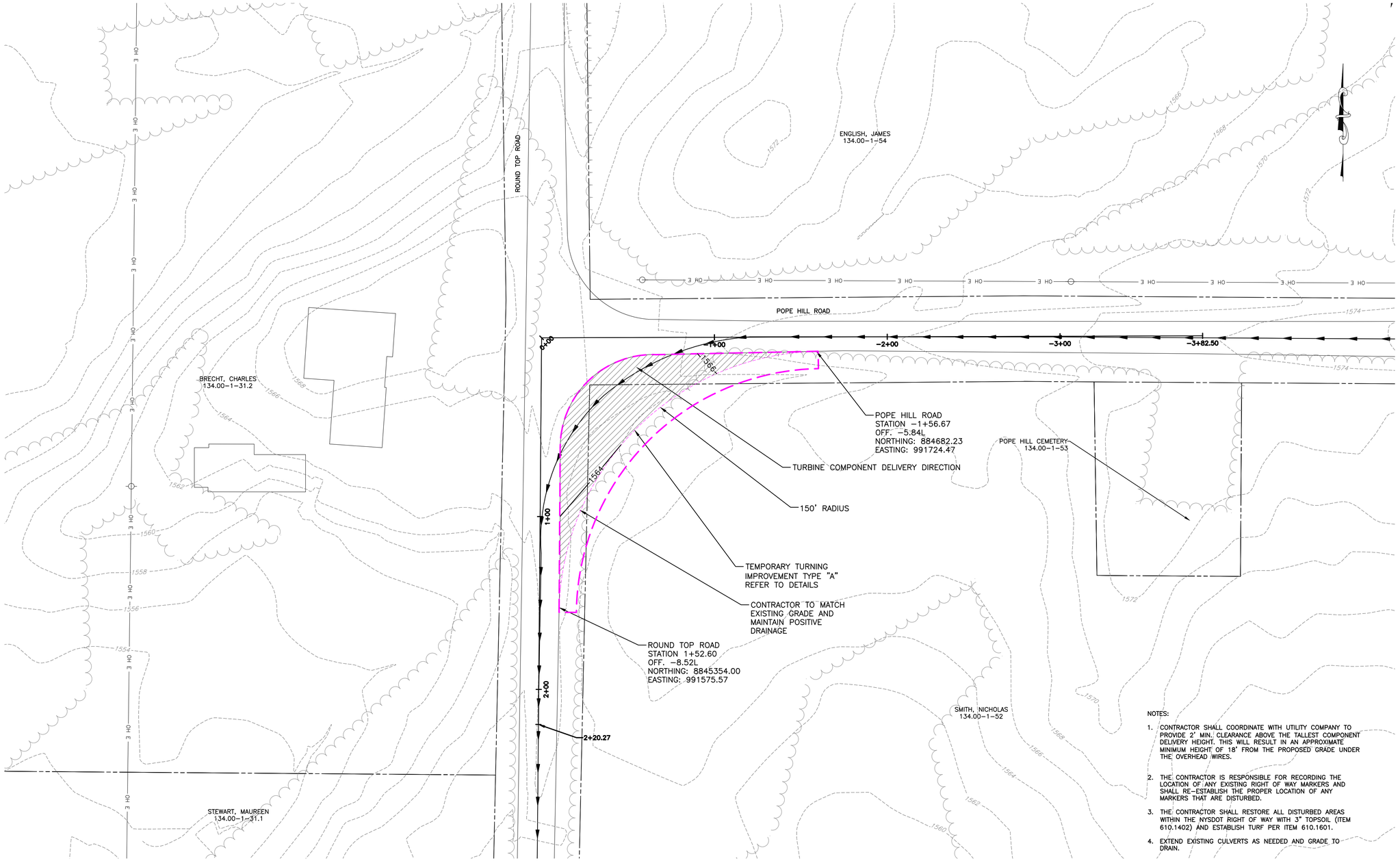
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
NORTH HILL RD & SMITH RD INTERSECTION IMPROVEMENT

DRAWING NO.
R-5



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4. EXTEND EXISTING CULVERTS AS NEEDED AND GRADE TO DRAIN.

ROUND TOP RD & POPE HILL RD INTERSECTION IMPROVEMENT
PLAN VIEW
SCALE: 22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

REV	DESCRIPTION	DATE	BY
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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
ROUND TOP RD & POPE HILL RD INTERSECTION IMPROVEMENT

DRAWING NO.
R-6

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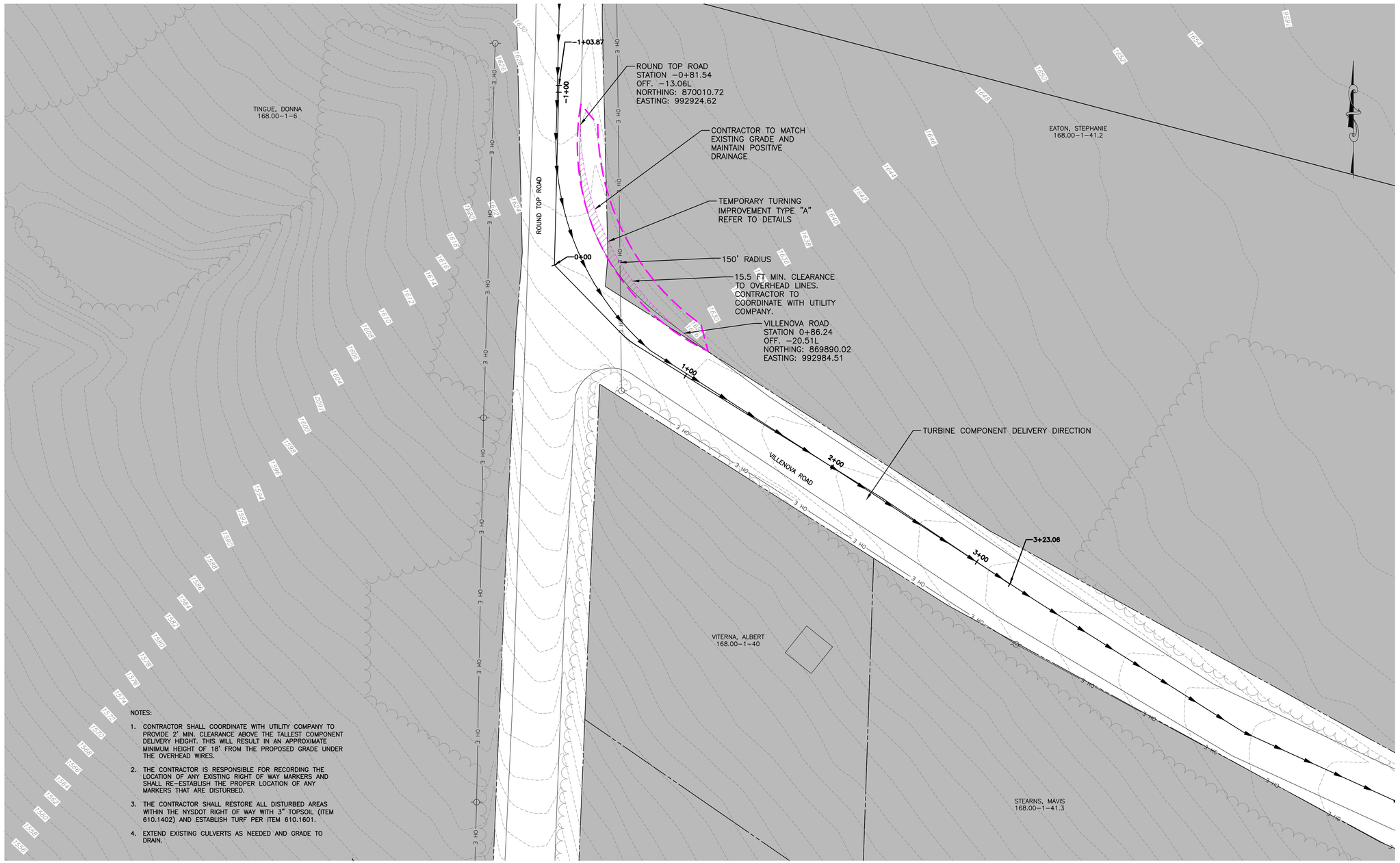

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4. EXTEND EXISTING CULVERTS AS NEEDED AND GRADE TO DRAIN.

ROUND TOP RD & VILLENOVA RD INTERSECTION IMPROVEMENT
PLAN VIEW
SCALE: 22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

REV	DESCRIPTION	DATE	BY
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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
ROUND TOP RD & VILLENOVA RD INTERSECTION IMPROVEMENT

DRAWING NO.
R-7

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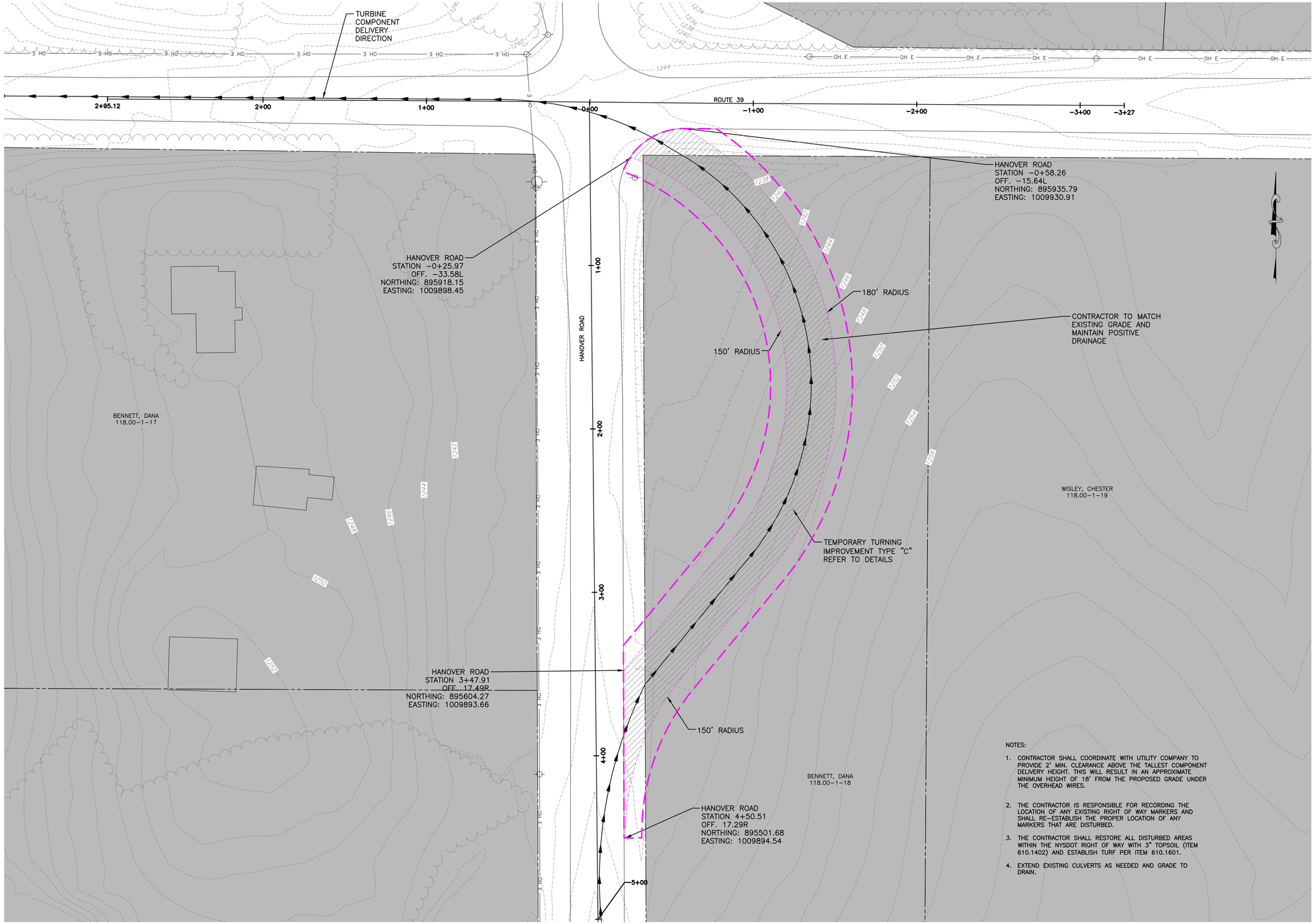

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30 FEET 0 30 60 90
Scale: 1"=30'

ROUTE 39 & HANOVER RD INTERSECTION IMPROVEMENT
PLAN VIEW
SCALE: 22X34 1"=30'

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
ROUTE 39 & HANOVER RD INTERSECTION IMPROVEMENT

DRAWING NO.
R-8

SHEET 49 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 R-8_R-10 intersection improvement.dwg
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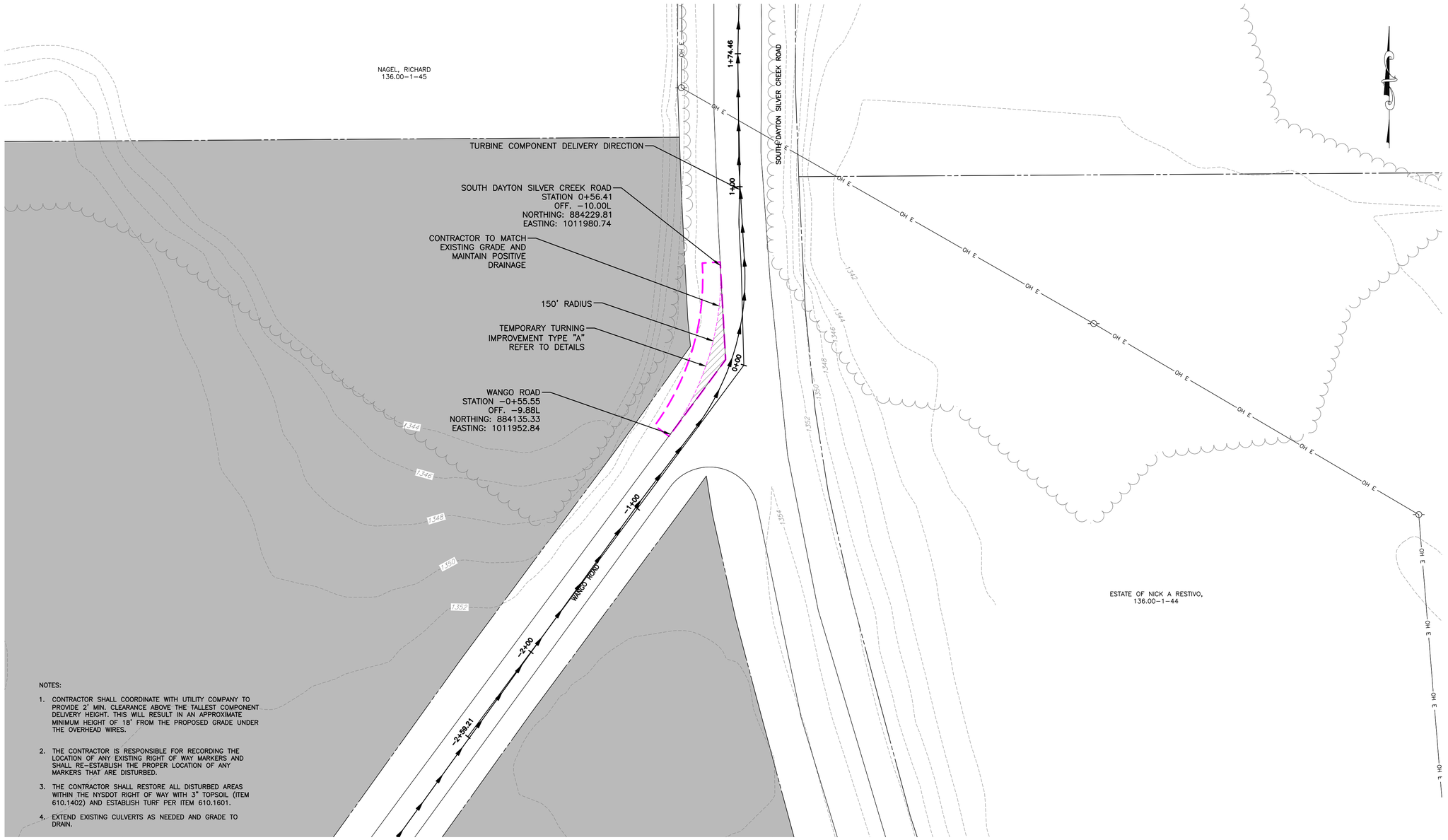

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SOUTH DAYTON SILVER CREEK RD & WANGO RD INTERSECTION IMPROVEMENT
PLAN VIEW
SCALE: 22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
SOUTH DAYTON SILVER CREEK RD & WANGO RD
INTERSECTION IMPROVEMENT

DRAWING NO.
R-9

SHEET 50 OF 81

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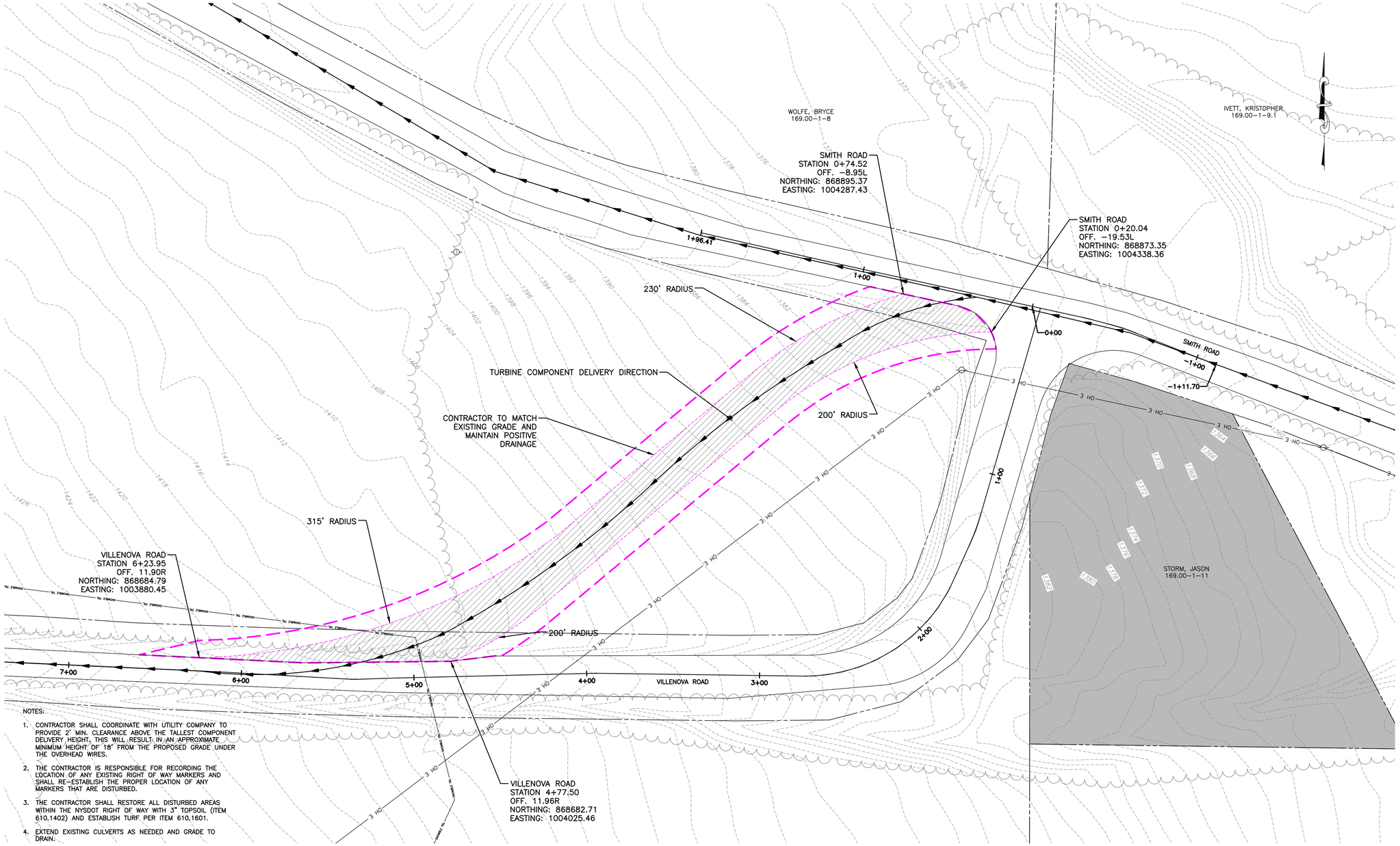

VILLENOVA RD & SMITH RD INTERSECTION IMPROVEMENT
PLAN VIEW
SCALE: 22X34 1"=30'

30 FEET 0 30 60 90
Scale: 1"=30'

REV	DESCRIPTION	DATE	BY
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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
VILLENOVA RD & SMITH RD INTERSECTION IMPROVEMENT

DRAWING NO.
R-10

SHEET 51 OF 81

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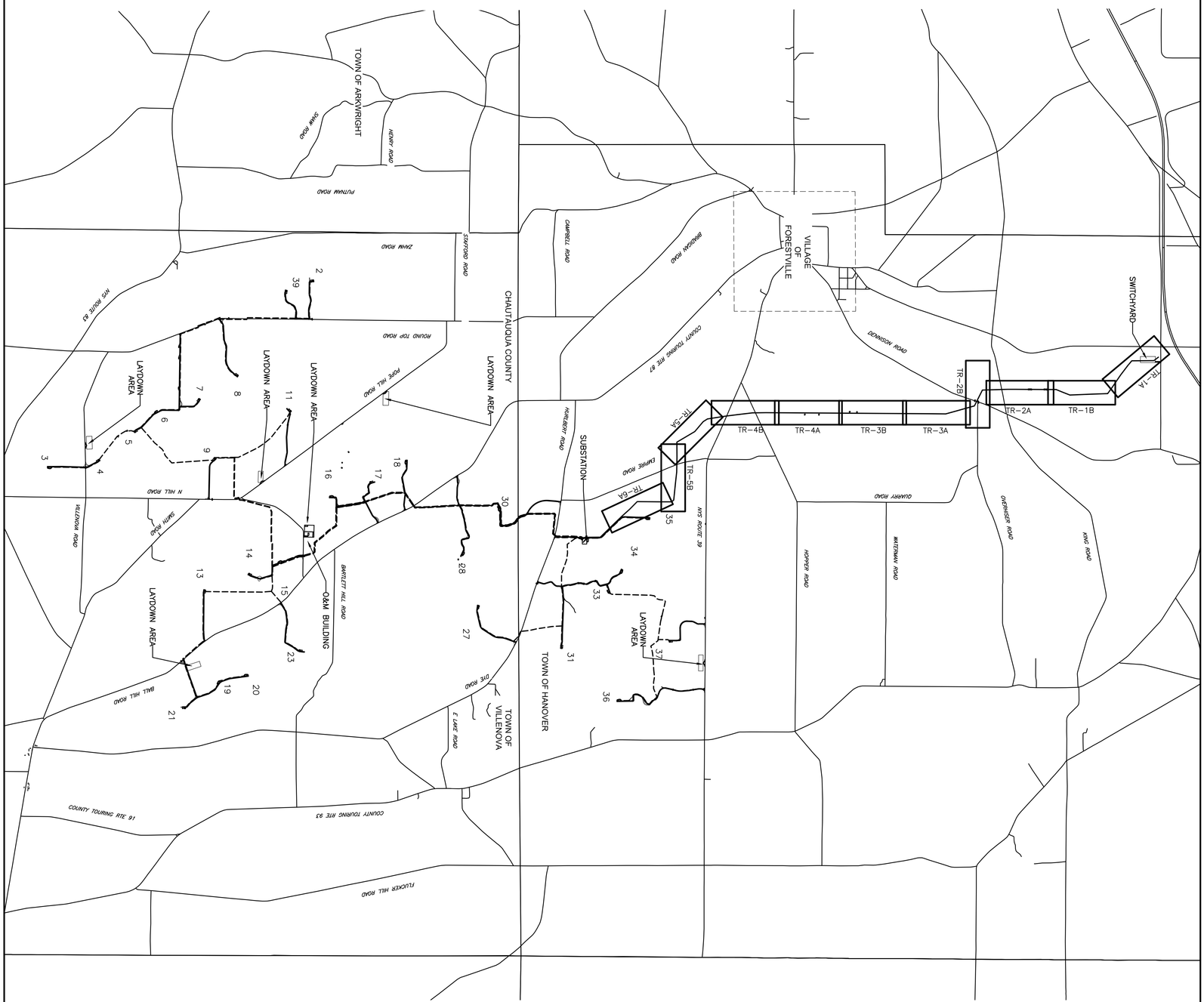

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IND-TR
DRAWING NO.
SHEET 52 OF 81

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
OVERHEAD TRANSMISSION LINE PLANS INDEX

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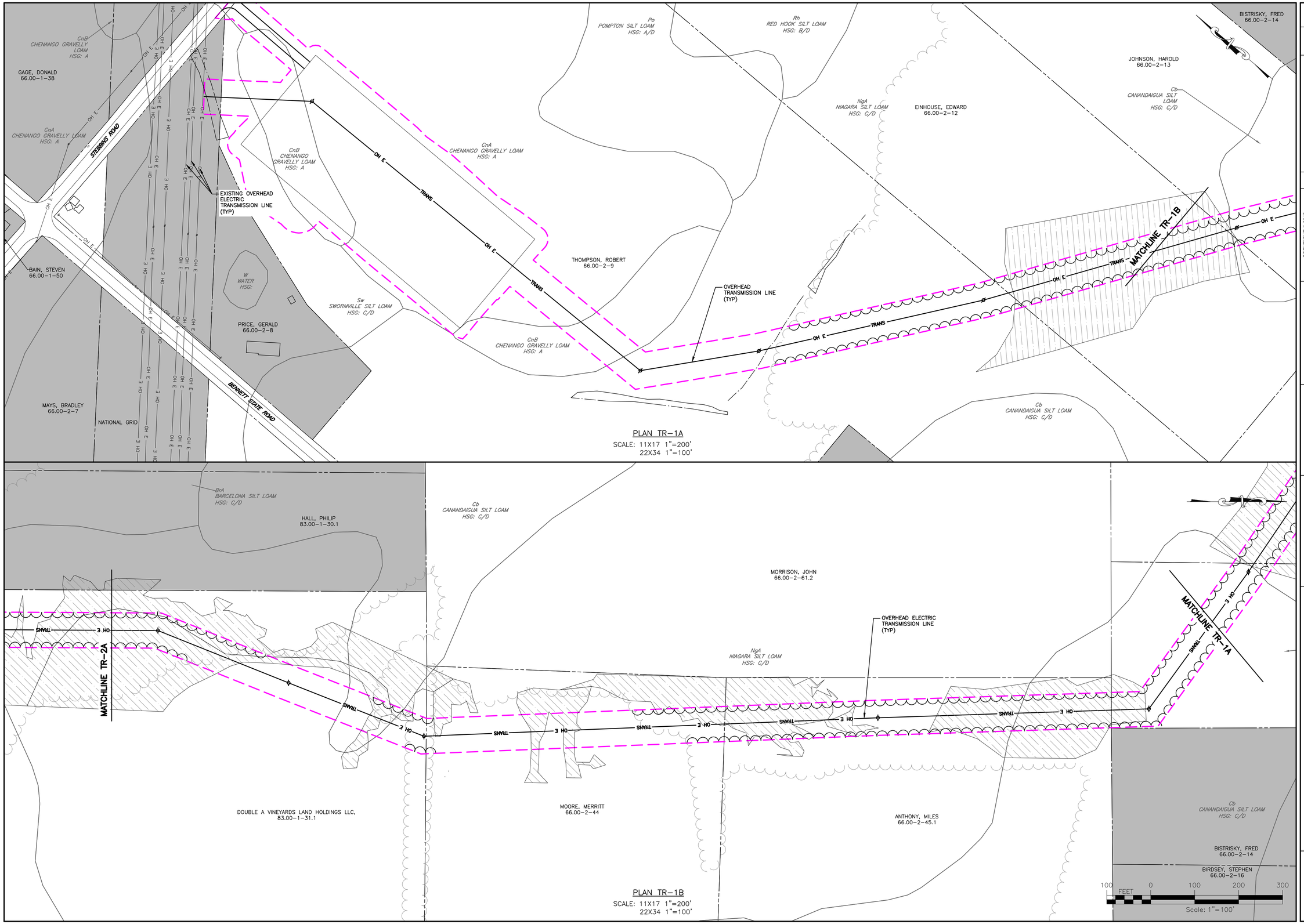

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1	FILE LAYOUT		

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150001
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DRAWN BY
JS, BA
SCALE
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ISSUE DATE
OCT. 2016

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
OVERHEAD TRANSMISSION LINE PLAN

DRAWING NO.
TR-1

SHEET 53 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 TR-1A - TR-6A.dwg
DATE/TIME: 10/14/2016 12:26:16 PM
USER: Steven Mellott

DOUBLE A VINEYARDS LAND HOLDINGS LLC, 83.00-3-4

CnB CHENANGO GRAVELLY LOAM HSG: A

W WATER HSG:

ASKIN, R 83.00-1-30.2

OVERHEAD ELECTRIC TRANSMISSION LINE (TYP)

Sw SWORMVILLE SILT LOAM HSG: C/D

HALL, PHILIP 83.00-1-30.1

BrA BARCELONA SILT LOAM HSG: C/D

NgA NIAGARA SILT LOAM HSG: C/D

MATCHLINE TR-2B

MATCHLINE TR-1B

TRANS 3 HO

OH E

KING ROAD

CnA CHENANGO GRAVELLY LOAM HSG: A

DOUBLE A VINEYARDS LAND HOLDINGS LLC, 83.00-1-31.1

Po POMPTON SILT LOAM HSG: A/D

CnA HENANGO GRAVELLY LOAMS HSG: A

Cb CANANDAIGUA SILT LOAM HSG: C/D

PLAN TR-2A
SCALE: 11X17 1"=200'
22X34 1"=100'

FALCONE FARMS, INC., 83.00-1-28.1

FALCONE FARMS INC, 83.00-3-3

MATCHLINE TR-2A

DOUBLE A VINEYARDS LAND HOLDINGS LLC, 83.00-3-4

OVERHEAD ELECTRIC TRANSMISSION LINE (TYP)

DOUBLE A VINEYARDS LAND HOLDINGS LLC, 83.00-1-31.1

CnA CHENANGO GRAVELLY LOAMS HSG: A

DENNISON ROAD

THOMPSON, SCOTT 83.00-1-56.2

THOMPSON, STANLEY 83.00-1-56.1

EX. CULVERT

OVERHISER ROAD

NATL FUEL GAS SUPPLY CORP, 83.00-3-5

OrB ORPARK SILT LOAM HSG: C/D

KERSTETTER, JACQUELYN 83.00-4-12

ROBINSON, VALERIE 83.00-4-2

MATCHLINE TR-3A

OLSEN, GARRY 83.00-3-6.1

Rh RED HOOK SILT LOAM HSG: B/D

PLAN TR-2B
SCALE: 11X17 1"=200'
22X34 1"=100'

100 FEET 0 100 200 300
Scale: 0"=100'

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BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
OVERHEAD TRANSMISSION LINE PLAN

DRAWING NO.
TR-2

SHEET 54 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 TR-1A - TR-6A.dwg
DATE/TIME: 10/14/2016 12:26:52 PM
USER: Steven Mellott

FRANKLIN, LEROY
83.00-4-26

EVERHART, TODD
83.00-4-24

NEWTON, DEAN
83.00-4-27

NgB
NIAGARA SILT LOAM
HSG: C/D

CnB
CHENANGO GRAVELLY LOAM
HSG: A

HrD
HORNELL SILT LOAM
HSG: D

LORD, SHARON
83.00-4-1

OVERHEAD ELECTRIC TRANSMISSION LINE (TYP)

MATCHLINE TR-3B

MATCHLINE TR-2B

3 HO — TRANS — 3 HO — TRANS — 3 HO — TRANS — 3 HO — TRANS — 3 HO — TRANS — 3 HO — TRANS — 3 HO

HrB
HORNELL SILT LOAM
HSG: D

HrA
HORNELL SILT LOAM
HSG: D

KERSTETTER, JACQUELYN
83.00-4-12

W
WATER
HSG:

ROBINSON, VALERIE
83.00-4-2

PLAN TR-3A
SCALE: 11X17 1"=200'
22X34 1"=100'

LORD, SHARON
100.00-1-7

FmA
FREMONT SILT LOAM
HSG: C/D

KAYE, QUINN
83.00-3-14.1

FmB
FREMONT SILT LOAM
HSG: C/D

EX. CULVERT

EX. CULVERT

OVERHEAD ELECTRIC TRANSMISSION LINE (TYP)

MATCHLINE TR-4A

MATCHLINE TR-3A

TRANS — 3 HO — TRANS — 3 HO — TRANS — 3 HO — TRANS — 3 HO — TRANS — 3 HO — TRANS — 3 HO

JOHNSON, MICHAEL
100.00-1-8

SCHNEIDER, DOROTHY
100.00-1-9.1

W
WATER
HSG:

HrB
HORNELL SILT LOAM
HSG: D

EVERHART, TODD
83.00-4-24

ToF
TOWERVILLE SILT LOAM
HSG: C/D

KERSTETTER, JACQUELYN
83.00-4-12

HrB
HORNELL SILT LOAM
HSG: D

PLAN TR-3B
SCALE: 11X17 1"=200'
22X34 1"=100'

100 0 100 200 300
FEET
Scale: 1"=100'

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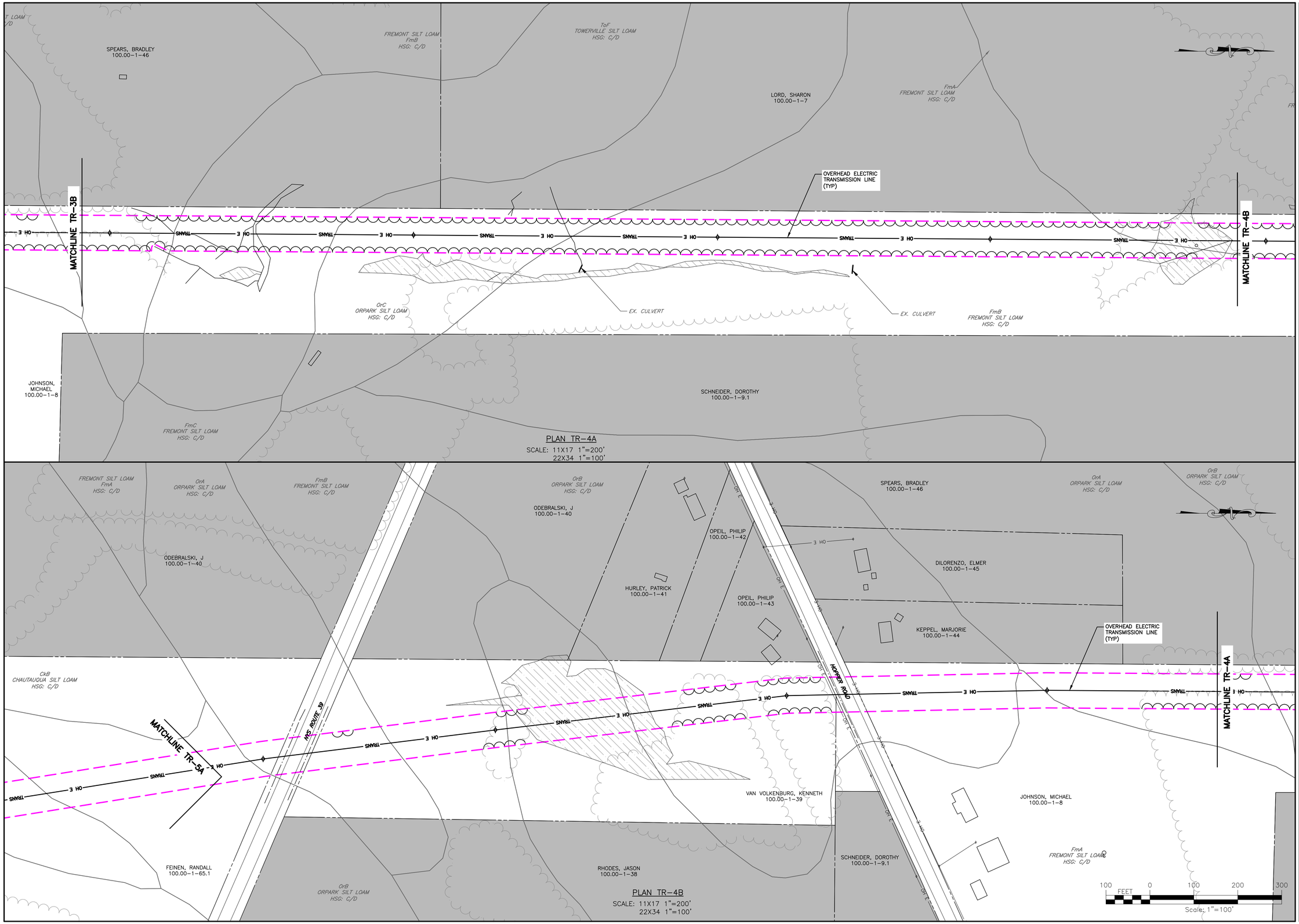
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
OVERHEAD TRANSMISSION LINE PLAN

DRAWING NO.
TR-3

SHEET 55 OF 81



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PROJECT
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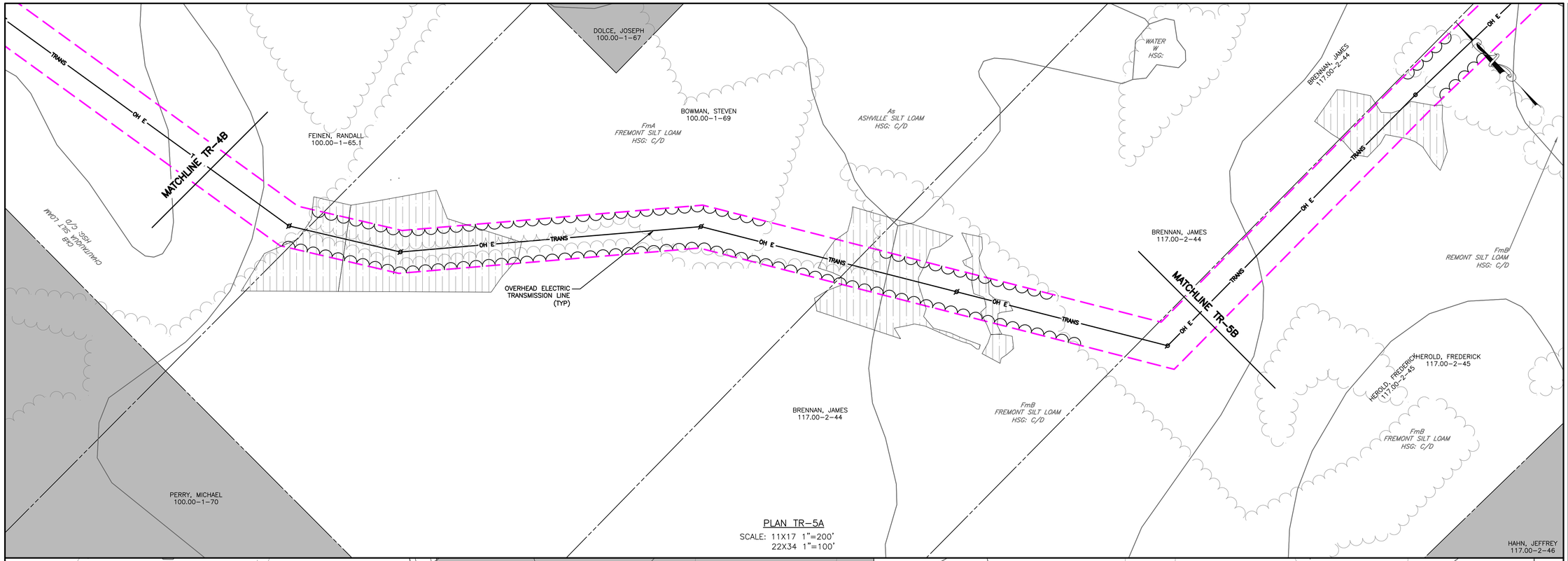
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
OVERHEAD TRANSMISSION LINE PLAN

DRAWING NO.
TR-4

SHEET 56 OF 81



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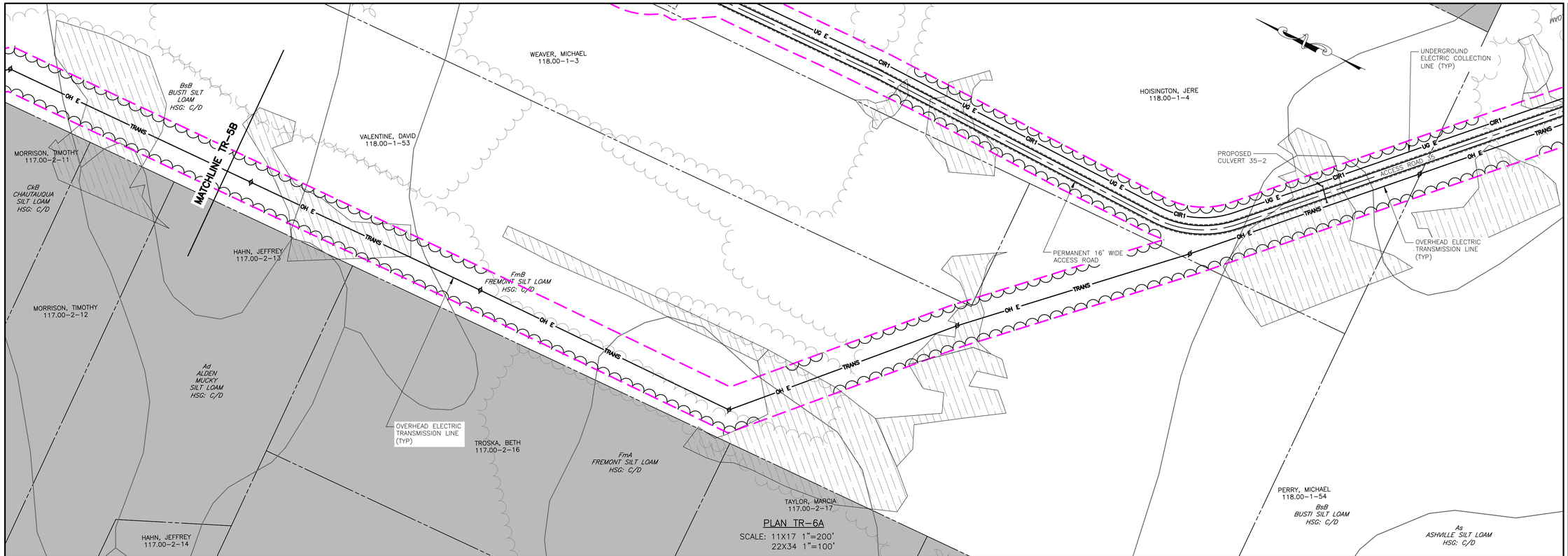
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
OVERHEAD TRANSMISSION LINE PLAN

DRAWING NO.
TR-5

SHEET 57 OF 81



PLAN TR-6A

SCALE: 11X17 1"=200'
22X34 1"=100'

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Scale: 1"=100'

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CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
OVERHEAD TRANSMISSION LINE PLAN

DRAWING NO.
TR-6

SHEET 58 OF 81

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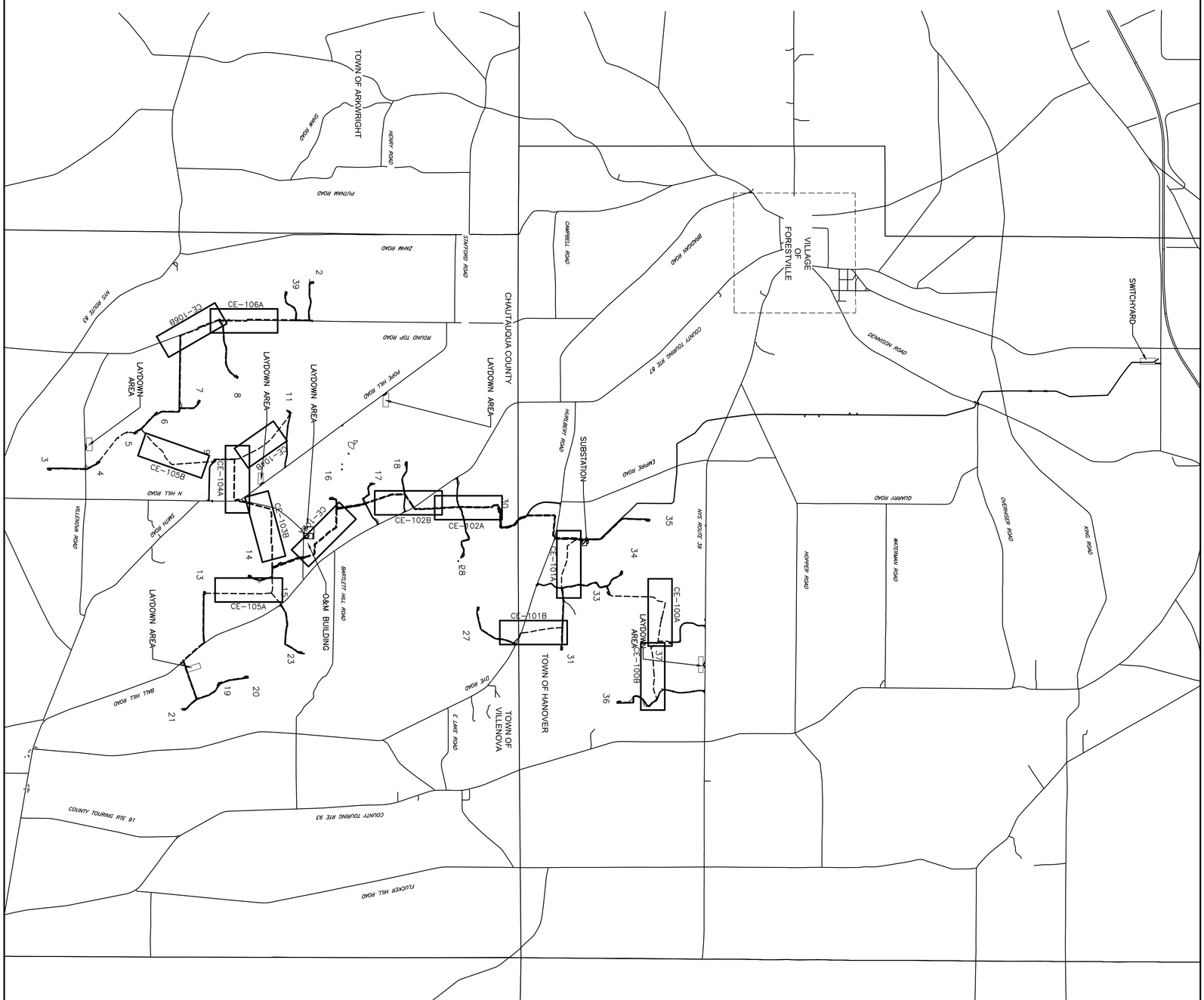

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Scale: 1"=1500'

IND-CE
DRAWING NO.

SHEET 59 OF 81

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
COLLECTION ROUTE INDEX

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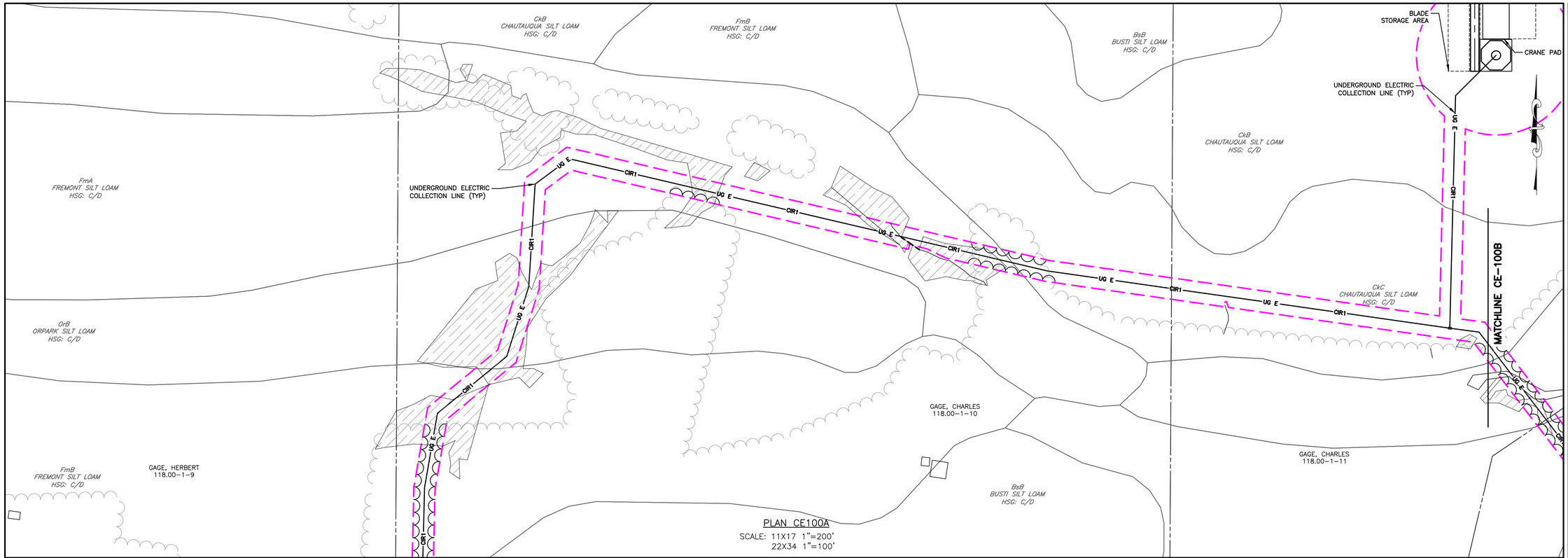

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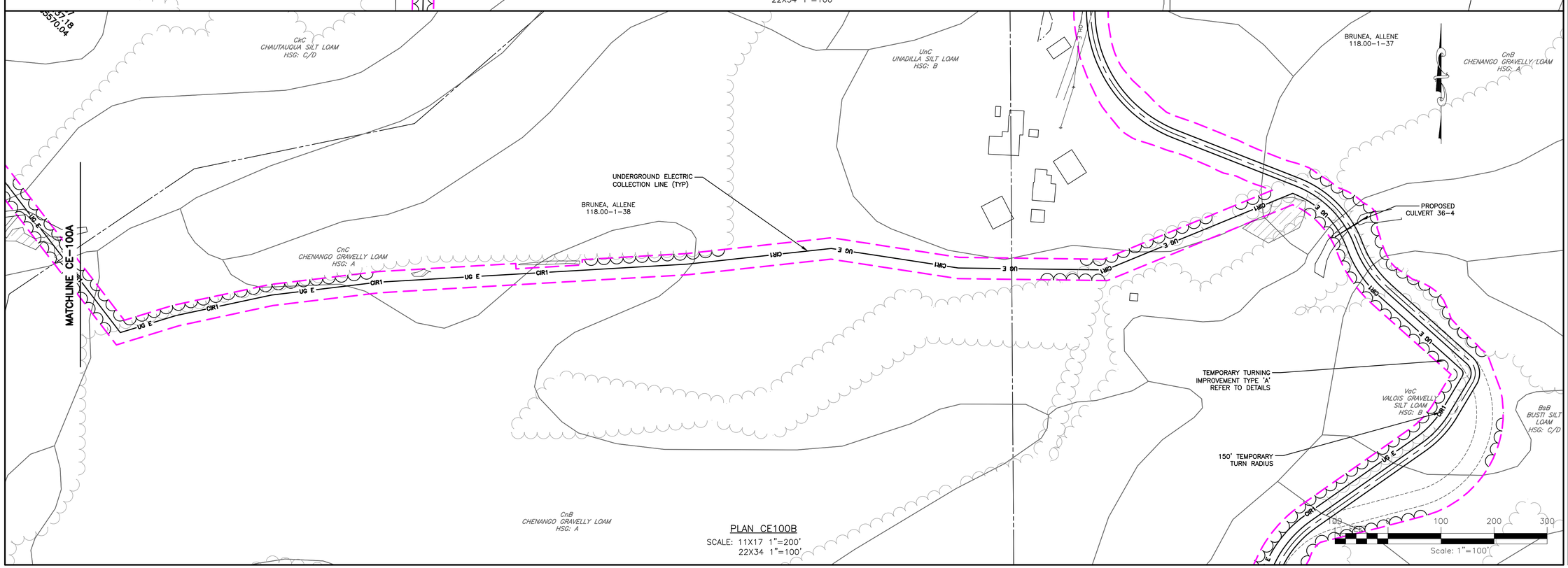

PLAN CE100B
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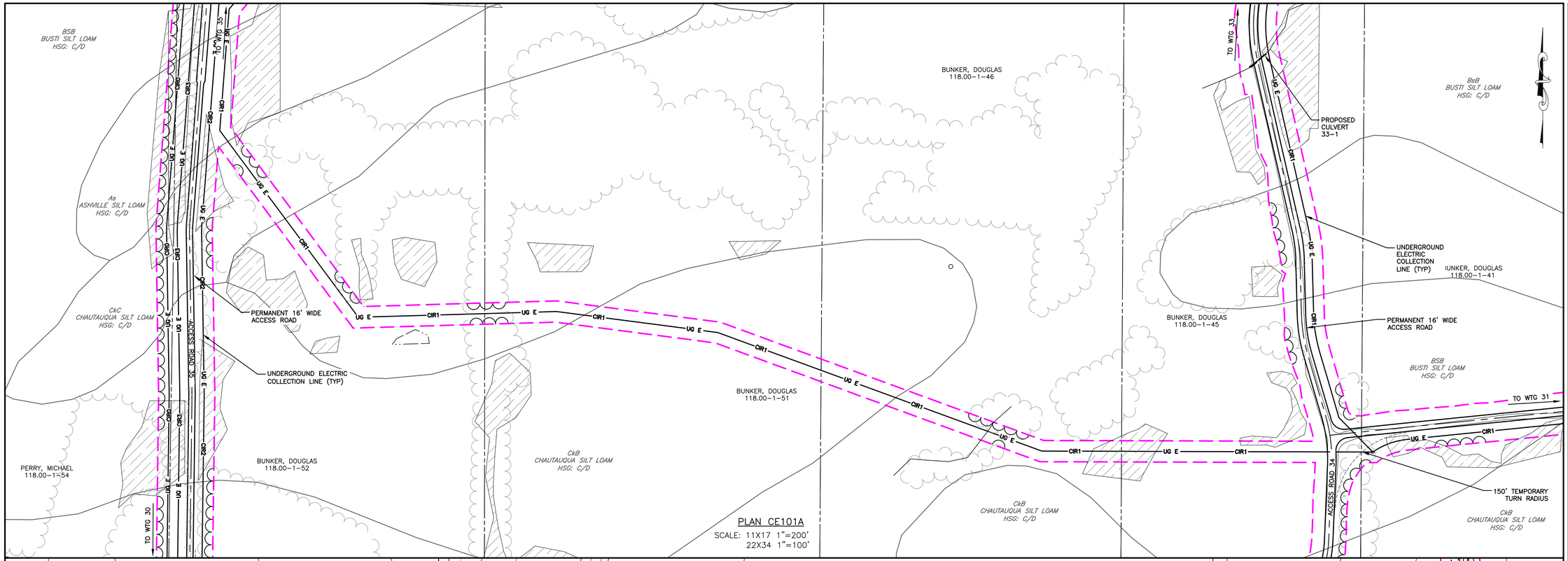
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

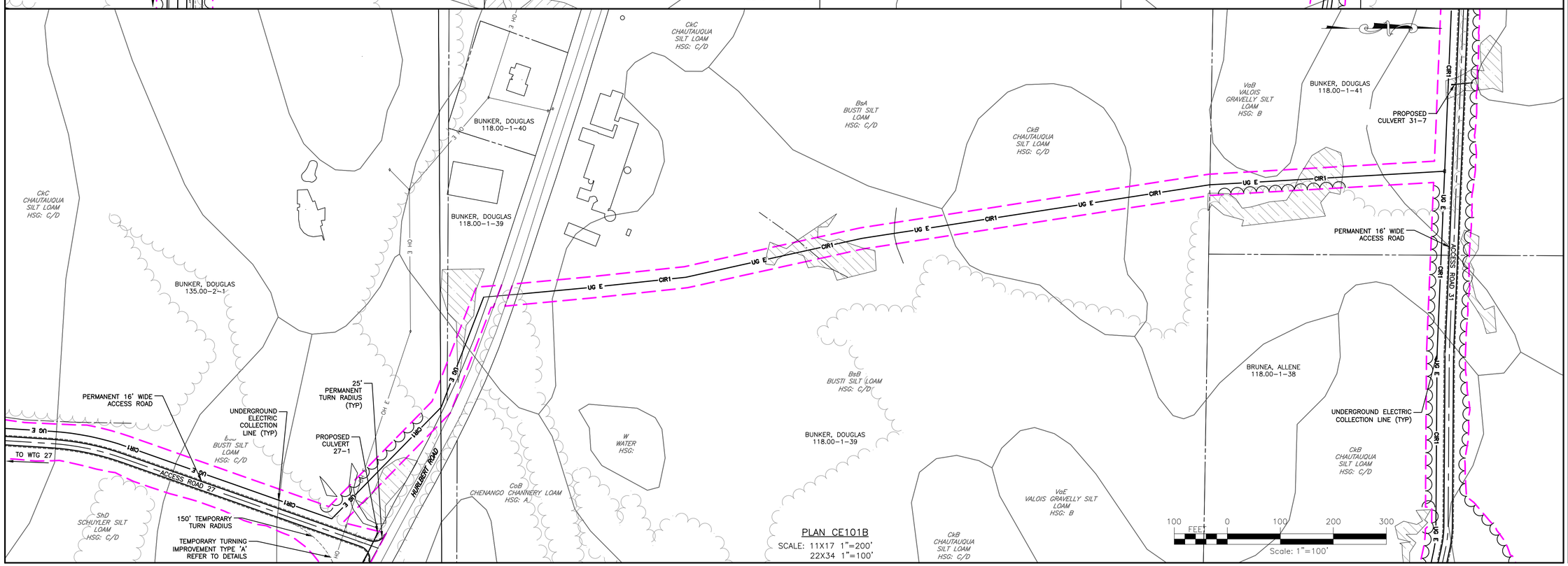
TITLE OF DRAWING
COLLECTION LINE PLAN

DRAWING NO.
CE-100

SHEET 60 OF 81



PLAN CE101A
SCALE: 11X17 1"=200'
22X34 1"=100'



PLAN CE101B
SCALE: 11X17 1"=200'
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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
COLLECTION LINE PLAN

DRAWING NO.
CE-101

O'CONNER, DAVID
134.00-2-14

O'CONNER, DAVID
134.00-2-15

PERMANENT 16' WIDE
ACCESS ROAD

LOMANTO, MICHAEL
134.00-2-10

OCONNOR, FLORENCE
134.00-2-13

CHAUTAQUA SILT LOAM
CkB
HSG: C/D

WTG: 30
N: 886988.37
E: 999722.04

UNDERGROUND ELECTRIC
COLLECTION LINE (TYP)

MATCHLINE CE-102B

PRESS, MARY
135.00-1-7

ACCESS ROAD 28

TO WTG 29

LOMANTO, MICHAEL
135.00-1-6

BSB
BUSTI SILT LOAM
HSG: C/D

SWANSON, FRIEDA
135.00-1-4

CRANE PAD

BLADE
STORAGE AREA

ACCESS ROAD 30

AS
ASHVILLE SILT LOAM
HSG: C/D

PLAN CE102A
SCALE: 11X17 1"=200'
22X34 1"=100'

TO WTG 18

As
ASHVILLE SILT LOAM
HSG: C/D

GAJEWSKI, MICHAEL
134.00-2-17.1

ErB
ERIE SILT LOAM
HSG: D

SCOTT, LINDA
134.00-2-18

FREMONT
SILT LOAM
FmB
HSG: C/D

O'CONNER, DAVID
134.00-2-14

O'CONNER, DAVID
134.00-2-15

GREENE, MARK
134.00-2-16

CHAUTAQUA SILT LOAM
CkB
HSG: C/D

ACCESS ROAD 18

PERMANENT 16' WIDE
ACCESS ROAD

VaB
VALOIS GRAVELLY SILT LOAM
HSG: B

UNDERGROUND ELECTRIC
COLLECTION LINE (TYP)

BsB
BUSTI SILT LOAM
HSG: C/D

CkB
CHAUTAUQUA
SILT LOAM
HSG: C/D

PRESS, BRIAN
135.00-1-9.2

LnB
LANGFORD SILT LOAM
HSG: D

25' PERMANENT
TURN RADIUS (TYP)

BALL HILL ROAD

TEMPORARY TURNING
IMPROVEMENT TYPE 'A'
REFER TO DETAILS

150' TEMPORARY
TURN RADIUS

PRESS, BRIAN
135.00-1-15.3

PRESS, RENEE
135.00-1-10

GAJEWSKI, MICHAEL
135.00-1-9.1

MATCHLINE CE-102A

GREENE, KATHLEEN
135.00-1-8

PLAN CE102B
SCALE: 11X17 1"=200'
22X34 1"=100'

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Scale: 1"=100'

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FA PROJECT NO.
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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
COLLECTION LINE PLAN

DRAWING NO.
CE-102

SHEET 62 OF 81

LnC
LANGFORD SILT LOAM
HSG: D

ErB
ERIE SILT LOAM
HSG: D

R & K HOLLAND TRUST,
135.00-1-18

LnB
LANGFORD SILT LOAM
HSG: D

ErA
ERIE SILT LOAM
HSG: D

SARVER, GLORIA
135.00-1-19

CkB
CHAUTAUQUA SILT LOAM
HSG: C/D

SCOTT, HAROLD
135.00-1-15.2

SCOTT, LINDA
135.00-1-15.1

UNDERGROUND ELECTRIC
COLLECTION LINE (TYP)

TEMPORARY TURNING
IMPROVEMENT TYPE 'A'
REFER TO DETAILS

PROPOSED CULVERT
15-1a

150' TEMPORARY
TURN RADIUS

HAGMIER, JARED
152.00-1-1

PROPOSED
CULVERT 15-1

TO WTG 15

AsB
ASHVILLE SILT LOAM
HSG: C/D

NORTH HILL ROAD

TEMPORARY TURNING
IMPROVEMENT TYPE 'B'
REFER TO DETAILS

PERMANENT 16' WIDE
ACCESS ROAD

150' TEMPORARY
TURN RADIUS

ACCESS ROAD 16

ORTEL, DONALD
152.00-1-5

PERMANENT 16' WIDE
ACCESS ROAD

ErA
ERIE SILT LOAM
HSG: D

PLAN CE103A

SCALE: 11X17 1"=200'
22X34 1"=100'

Fe
FLUVAQUENTS-UDIFLUVENTS
COMPLEX
HSG: A/D

ChD
CHADAKOIN
SILT LOAM
HSG: B

OVERHEAD
ELECTRIC
TRANSMISSION
LINE (TYP)

TROUTMAN,
PAULA
152.00-1-11

TROUTMAN, PAULA
151.00-2-4.1

BARNES, SUSAN
151.00-2-5.2

BsB
BUSTI SILT
LOAM
HSG: C/D

MATCHLINE CE-104A

152.00-1-10.000

CkC
CHAUTAUQUA
SILT LOAM
HSG: C/D

ErB
ERIE SILT
LOAM
HSG: D

TROUTMAN, PAULA
152.00-1-11

LnC
LANGFORD
SILT LOAM
HSG: D

CHADAKOIN SILT LOAM
ChD
HSG: B

PLAN CE103B

SCALE: 11X17 1"=200'
22X34 1"=100'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
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P. McCARTHY

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VT, TK

SCALE
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ISSUE DATE
OCT. 2016

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
COLLECTION LINE PLAN

DRAWING NO.
CE-103

SHEET 63 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 CE-100 - CE-106.dwg
DATE/TIME: 10/14/2016 12:33:36 PM
USER: Steven Mellott

LnB
LANGFORD SILT LOAM
HSG: D

BARNES, SUSAN
151.00-2-5.2

POPE HILL ROAD

MATCHLINE CE-103B

OVERHEAD ELECTRIC
TRANSMISSION LINE (TYP)

ECKER, MERLE
152.00-1-43

MATCHLINE CE-104B

UNDERGROUND ELECTRIC
COLLECTION LINE (TYP)

ErB
ERIE SILT LOAM
HSG: D

BARNES, SUSAN
151.00-2-7.2

NEWTON, RUSSELL
151.00-2-6

NORTH HILL ROAD

BsB
BUSTI SILT LOAM
HSG: C/D

PLAN CE104A
SCALE: 11X17 1"=200'
22X34 1"=100'

PARTYKA, JAMES
151.00-2-3.1

UNDERGROUND ELECTRIC
COLLECTION LINE (TYP)

ErB
ERIE SILT LOAM
HSG: D

MATCHLINE CE-104A

BARNES, SUSAN
151.00-2-5.2

CkB
CHAUTAUQUA SILT LOAM
HSG: C/D

WOODSIDE, STUART
151.00-2-5.1

BsB
BUSTI SILT LOAM
HSG: C/D

BsB
BUSTI SILT LOAM
HSG: C/D

PLAN CE104B
SCALE: 11X17 1"=200'
22X34 1"=100'

100 FEET 0 100 200 300
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
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1	FILE LAYOUT		

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
COLLECTION LINE PLAN

DRAWING NO.
CE-104

SHEET 64 OF 81

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DATE/TIME: 10/14/2016 12:34:12 PM
USER: Steven Mellott

CHADAKOIN SILT LOAM
HSG: B

CkB
CHAUTAUQUA SILT LOAM
HSG: C/D

MALVESTUTO, ROBERT
152.00-1-14

MALVESTUTO, ROBERT
152.00-1-13

CkC
CHAUTAUQUA SILT LOAM
HSG: C/D

PARTYKA, JOSEPH
152.00-1-12

BsB
BUSTI SILT LOAM
HSG: C/D

152.00-1-10.000

UNDERGROUND ELECTRIC COLLECTION LINE (TYP)

ACCESS ROAD 14

CIRO

UG E

PLAN CE105A
SCALE: 11X17 1"=200'
22X34 1"=100'

TENEREWICZ, DANIEL
168.00-1-43

MCNAMARA, KATHERINE
151.00-2-14

WATERMAN, DAREN
151.00-2-9

STEARNS, ROBERTA
151.00-2-10

CIR2

PLAN CE105B
SCALE: 11X17 1"=200'
22X34 1"=100'

100 FEET 0 100 200 300
Scale: 1"=100'

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PROJECT MANAGER
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BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
COLLECTION LINE PLAN

DRAWING NO.
CE-105

SHEET 65 OF 81

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DATE/TIME: 10/14/2016 12:34:48 PM
USER: Steven Mellott

GOULD, DENISE
151.00-1-8

LnC
LANGFORD
SILT LOAM
HSG: D

GOULD, DENISE
151.00-2-23

YASKOW, CARL
151.00-1-7

EXISTING OVERHEAD
ELECTRIC TRANSMISSION
LINE (TYP)

PROPOSED
CULVERT 8-1A

MATCHLINE CE-106B

EX.
CULVERT
18"

LnB
LANGFORD SILT LOAM
HSG: D

TOURJIE, JOHN
151.00-1-6

BsC
BUSTI SILT LOAM
HSG: C/D

LANGWORTHY, RICHARD
151.00-1-4.1

EX. 18"
CULVERT

GOULD, DENNIS
151.00-1-9

ROUND TOP ROAD

150' TEMPORARY
TURN RADIUS

TEMPORARY TURNING
IMPROVEMENT TYPE 'B'
REFER TO DETAILS

25' PERMANENT
TURN RADIUS (TYP)

ACCESS ROAD 8

W
WATER
HSG:

ErB
ERIE SILT LOAM
HSG: D

UNDERGROUND
ELECTRIC
COLLECTION LINE
(TYP)

PERMANENT 16' WIDE
ACCESS ROAD

PERMANENT 16' WIDE
ACCESS ROAD

ERIE SILT LOAM
ErB
HSG: D

GOULD, DENISE
151.00-2-23

LnB
LANGFORD SILT LOAM
HSG: D

ERIE SILT LOAM
ErA
HSG: D

ERMER, DIANA
151.00-2-24

LnB
LANGFORD SILT LOAM
HSG: D

ErB
ERIE SILT LOAM
HSG: D

PLAN CE106A
SCALE: 11X17 1"=200'
22X34 1"=100'

TEMPORARY TURNING
IMPROVEMENT TYPE 'B'
REFER TO DETAILS

150' TEMPORARY
TURN RADIUS

ACCESS ROAD 8

TO WTG 8

PERMANENT 16' WIDE
ACCESS ROAD

PERMANENT 16' WIDE
ACCESS ROAD

LnB
LANGFORD SILT LOAM
HSG: D

25' PERMANENT
TURN RADIUS (TYP)

PROPOSED
CULVERT 8-1A

MATCHLINE CE-106A

OVERHEAD ELECTRIC
TRANSMISSION LINE (TYP)

GOULD, DENNIS
151.00-1-9

ErB
ERIE SILT LOAM
HSG: D

UNDERGROUND ELECTRIC
COLLECTION LINE (TYP)

GOULD, DENISE
151.00-1-8

PCHELKA, LORRI
151.00-2-20

ErA
ERIE SILT LOAM
HSG: D

CROWELL, ROBERT
151.00-2-19

ErB
ERIE SILT LOAM
HSG: D

PROPOSED
CULVERT 5-1

TEMPORARY TURNING
IMPROVEMENT TYPE 'A'
REFER TO DETAILS

150' TEMPORARY
TURN RADIUS

LnB
LANGFORD SILT LOAM
HSG: D

BUTCHER, JOHN
151.00-2-18

25' PERMANENT
TURN RADIUS (TYP)

OVERHEAD ELECTRIC
TRANSMISSION LINE (TYP)

ROUND TOP ROAD

QUINN, LESTER
151.00-1-10

GIBBS, JOHN
151.00-1-11

LINDQUIST, RUTH
151.00-1-12

SMITH, STEVEN
151.00-1-14

SEARS, KATHLEEN
151.00-1-15

LINDQUIST, DUANNE
151.00-1-13

W
WATER
HSG:

ChE
CHADAKOIN SILT LOAM
HSG: B

LnC
LANGFORD SILT LOAM
HSG: D

PLAN CE106B
SCALE: 11X17 1"=200'
22X34 1"=100'

100 0 100 200 300
FEET
Scale: 1"=100'

REV	DESCRIPTION	DATE	BY
1			
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150001

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VT, TK

SCALE
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ISSUE DATE
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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
COLLECTION LINE PLAN

DRAWING NO.
CE-106

SHEET 66 OF 81

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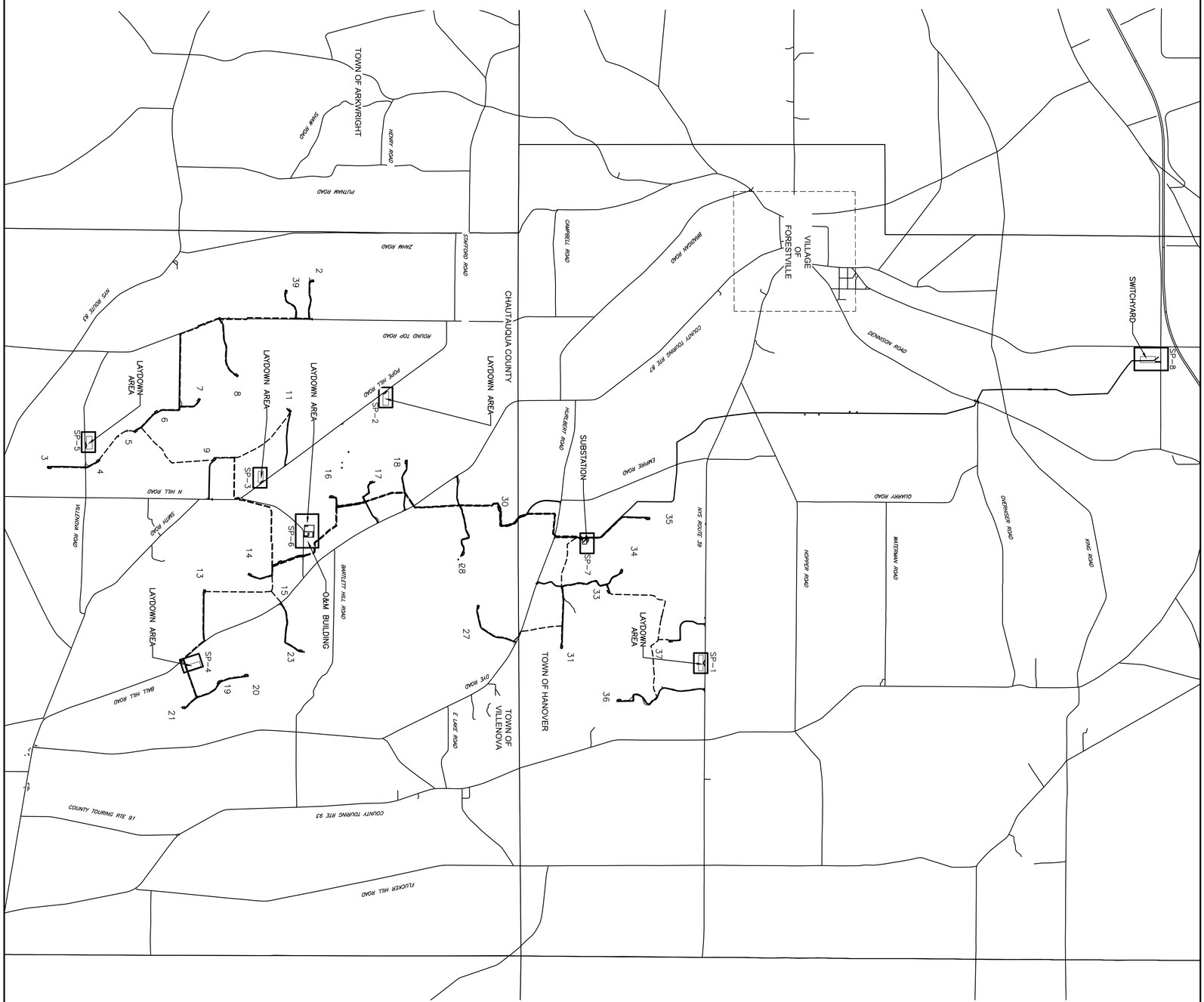

DRAWING NO.	IND-SP
SHEET 67 OF 81	
PROJECT	BALL HILL WIND FARM TOWNS OF HANOVER & VILLENOVA CHAUTAUQUA COUNTY, NY PRELIMINARY PLANS
TITLE OF DRAWING	SITE PLANS INDEX

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FA PROJECT NO.	150001
PROJECT MANAGER	P. McCARTHY
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REV	DESCRIPTION	DATE	BY
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YOUNGBERG, DONALD
101.00-2-27

TRI COUNTY HOLDING CORP.
101.00-2-26

NYS ROUTE 39

150' RADIUS

150' RADIUS

PROPOSED CULVERT

LAYDOWN YARD #1

SEDIMENT BASIN

FmB
FREMONT SILT LOAM
HSG: C/D

GAGE, CHARLES
118.00-1-11

CkC
CHAUTAUQUA SILT LOAM
HSG: C/D

30 FEET 0 30 60 90

Scale: 1"=30'

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENA\Eng\CAD\CUT\150001 SP-1 - SP-4.dwg
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REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
150001

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
LAYDOWN YARD 1 - SITE PLAN

DRAWING NO.
SP-1

SHEET 68 OF 81

FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 SP-1 - SP-4.dwg
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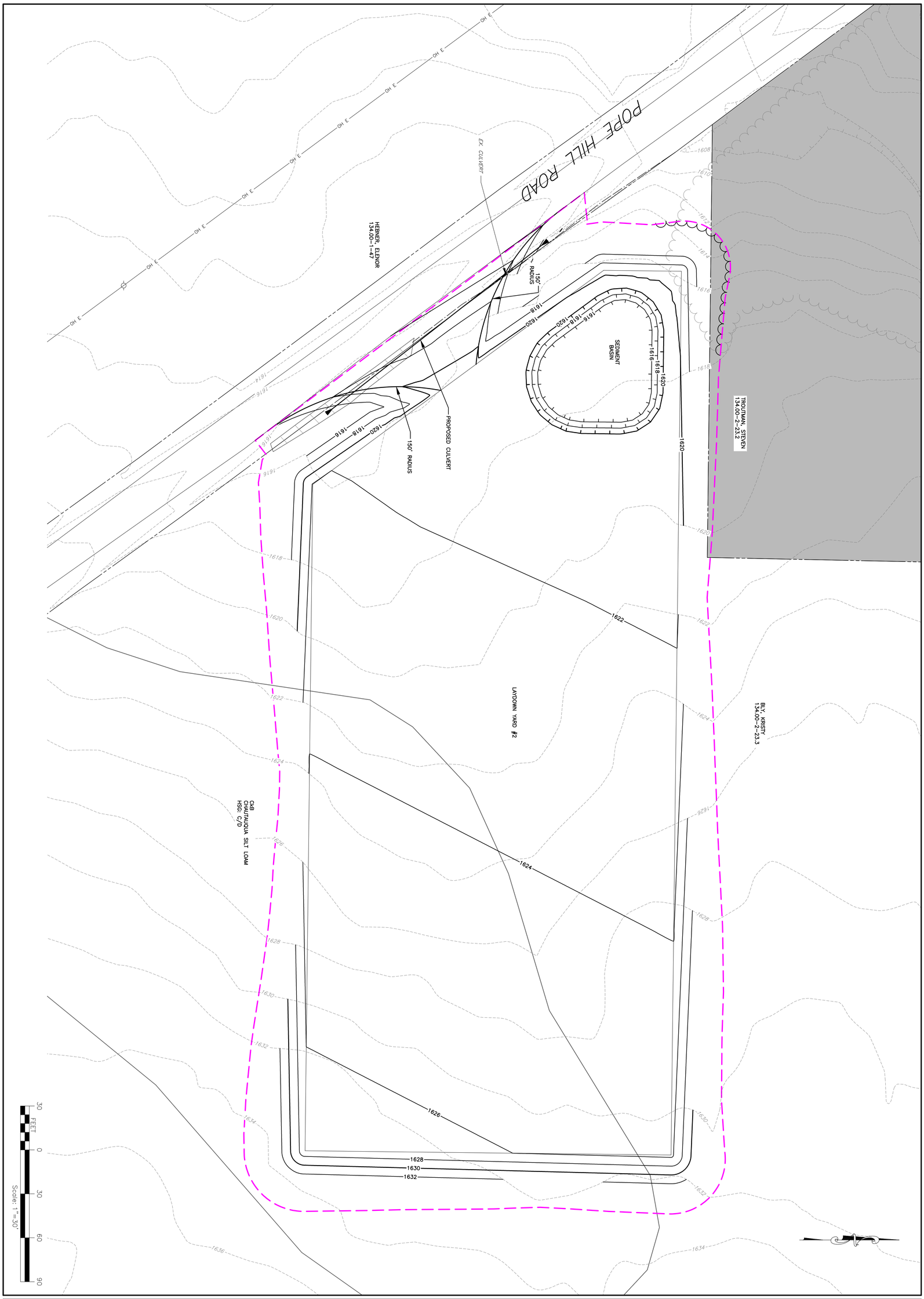

SHEET 69 OF 81

DRAWING NO. SP-2

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
LAYDOWN YARD 2 - SITE PLAN

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150001
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REV	DESCRIPTION	DATE	BY
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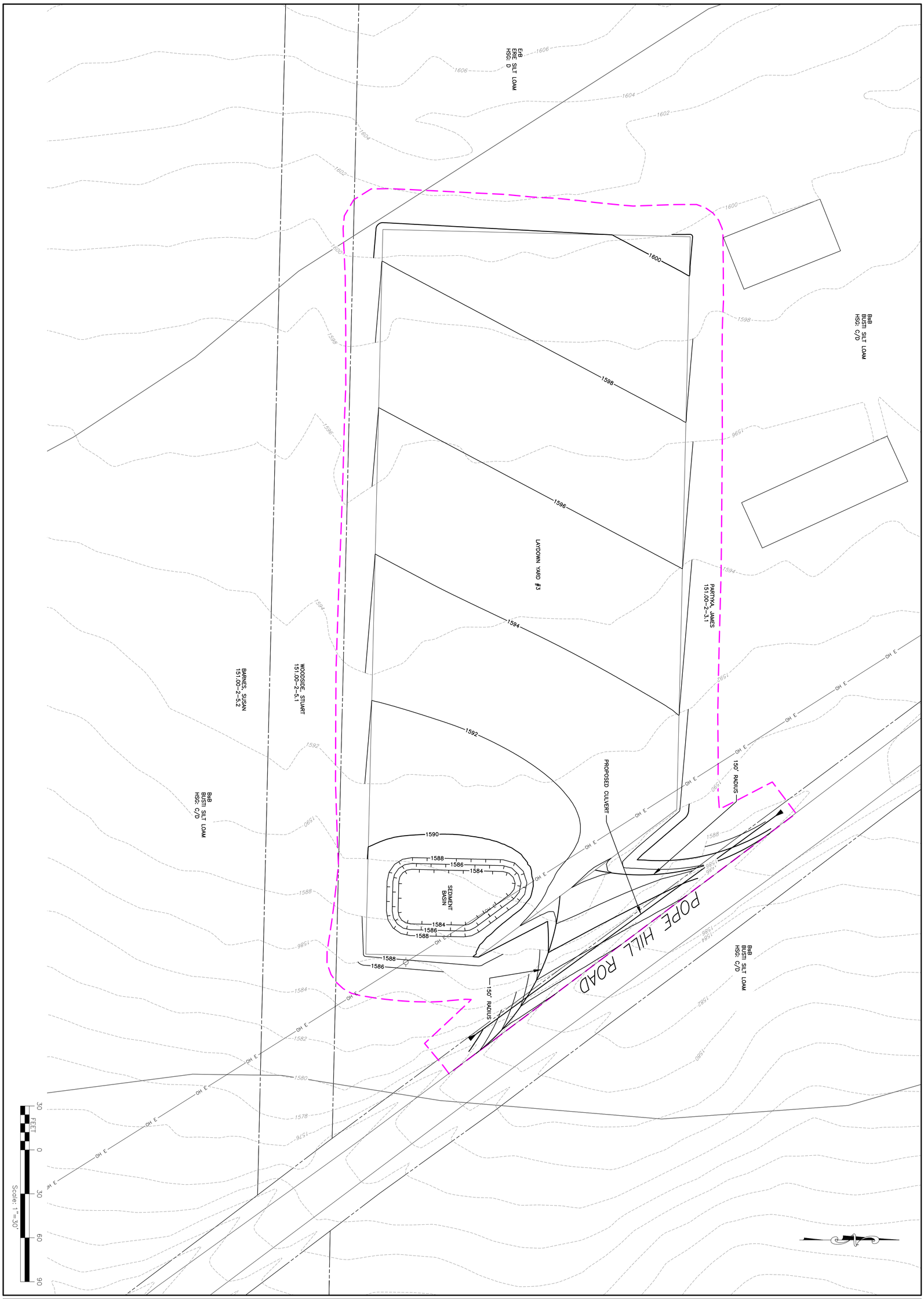

SHEET 70 OF 81

DRAWING NO.
SP-3

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
LAYDOWN YARD 3 - SITE PLAN

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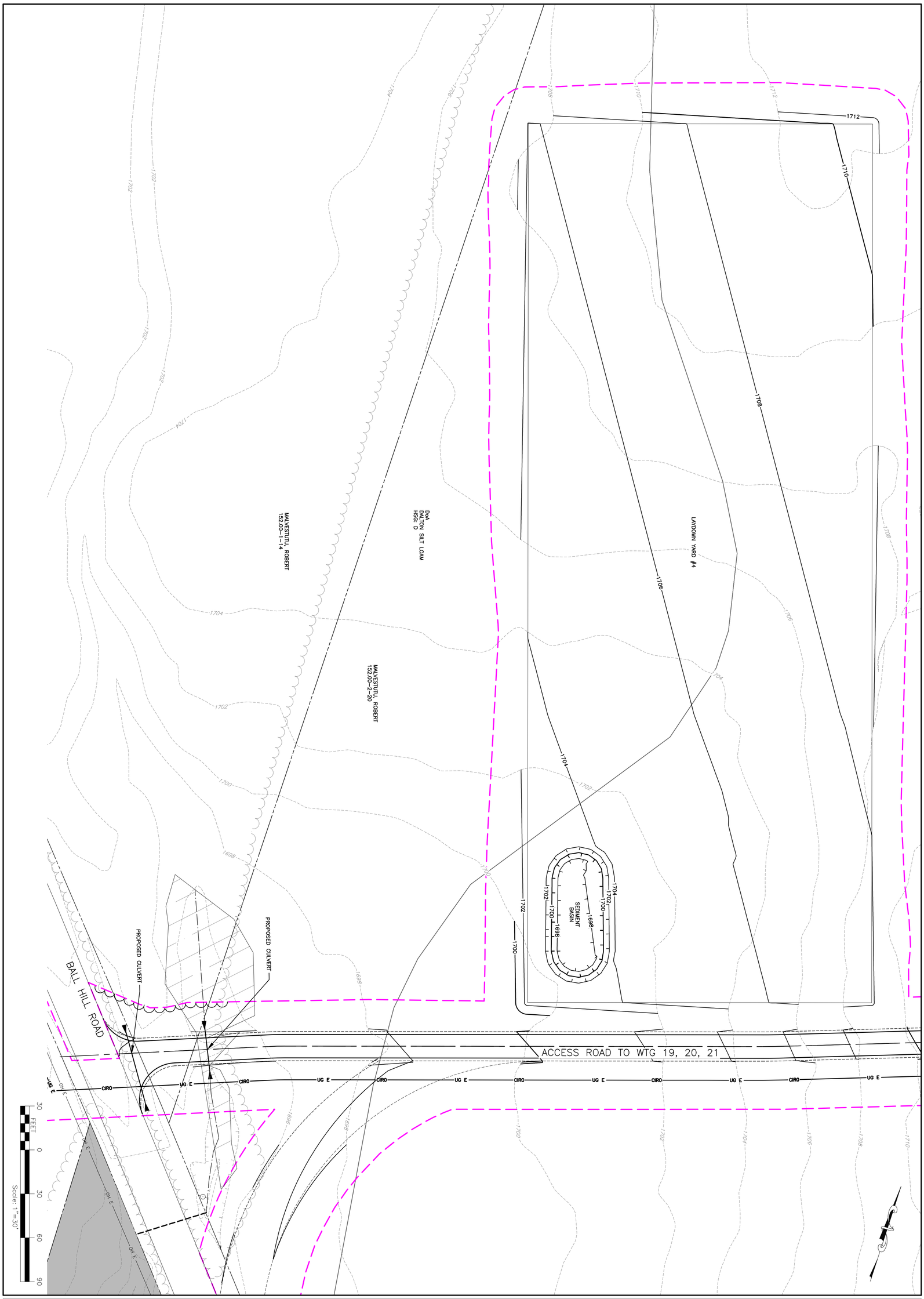

SHEET 71 OF 81

DRAWING NO.
SP-4

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
LAYDOWN YARD 4 - SITE PLAN

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REV	DESCRIPTION	DATE	BY
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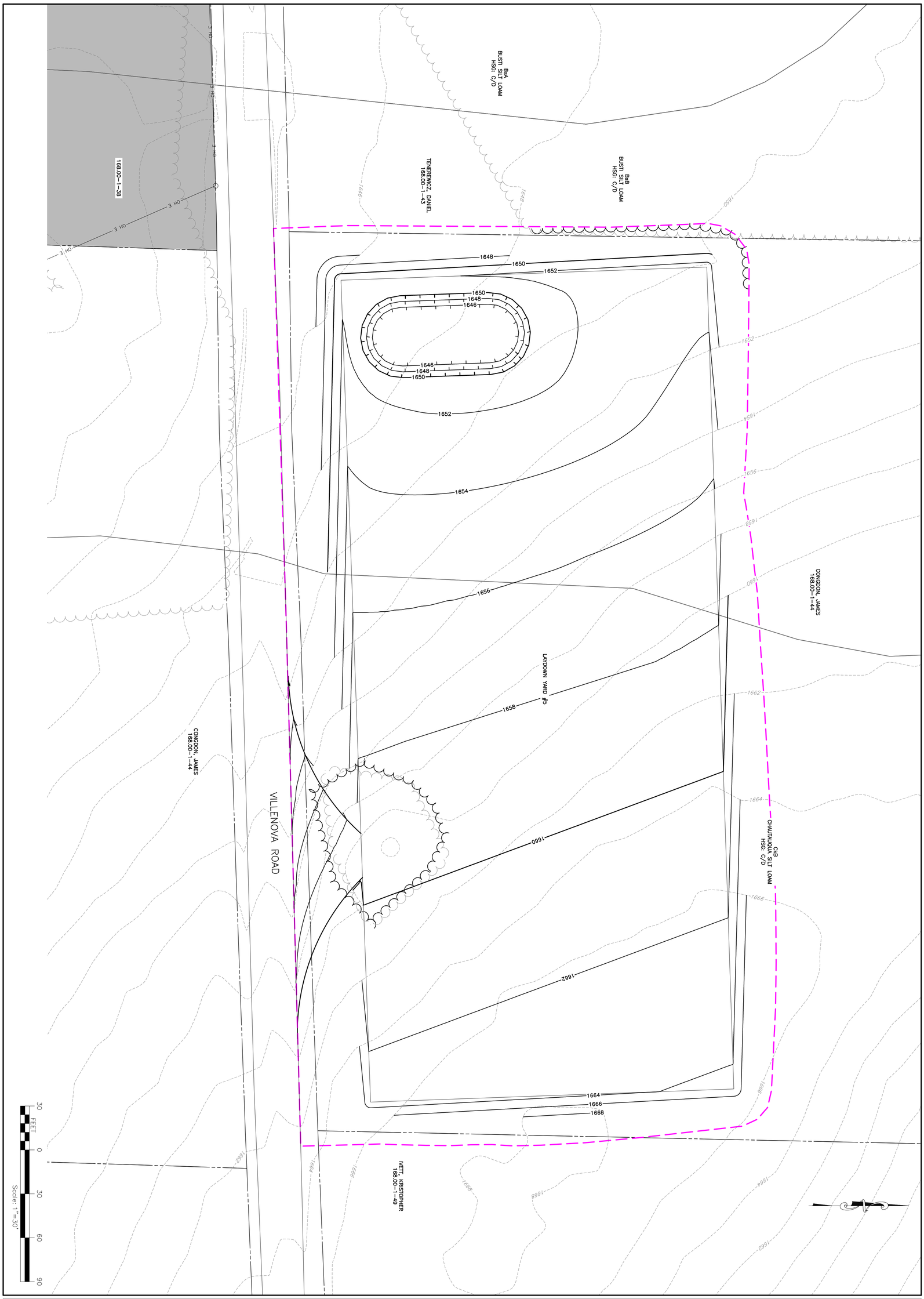

SHEET 72 OF 81

DRAWING NO.
SP-5

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
LAYDOWN YARD 5 - SITE PLAN

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150001
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P. McCARTHY
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VT, TK
SCALE
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REV	DESCRIPTION	DATE	BY
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SARVER, GLORIA
135.00-1-19

UNDERGROUND ELECTRIC
COLLECTION LINE (TYP)

OPERATIONS AND MAINTENANCE SITE

HAGMIER, JARED
152.00-1-1

STORMWATER
MANANGMENT BASIN

PROPOSED CULVERT

150' RADIUS

150' RADIUS

NORTH HILL ROAD

BROMLEY, LAVERNE
152.00-1-6

ORTEL, DONALD
152.00-1-5

TITUS, JONATHAN
152.00-1-7

30 0 30 60 90
FEET
Scale: 1"=30'

REV	DESCRIPTION	DATE	BY
7			
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FA PROJECT NO.
150001

PROJECT MANAGER
P. McCARTHY

DRAWN BY
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SCALE
AS SHOWN

ISSUE DATE
OCT. 2016

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
O&M SITE PLAN

DRAWING NO.
SP-6

SHEET 73 OF 81

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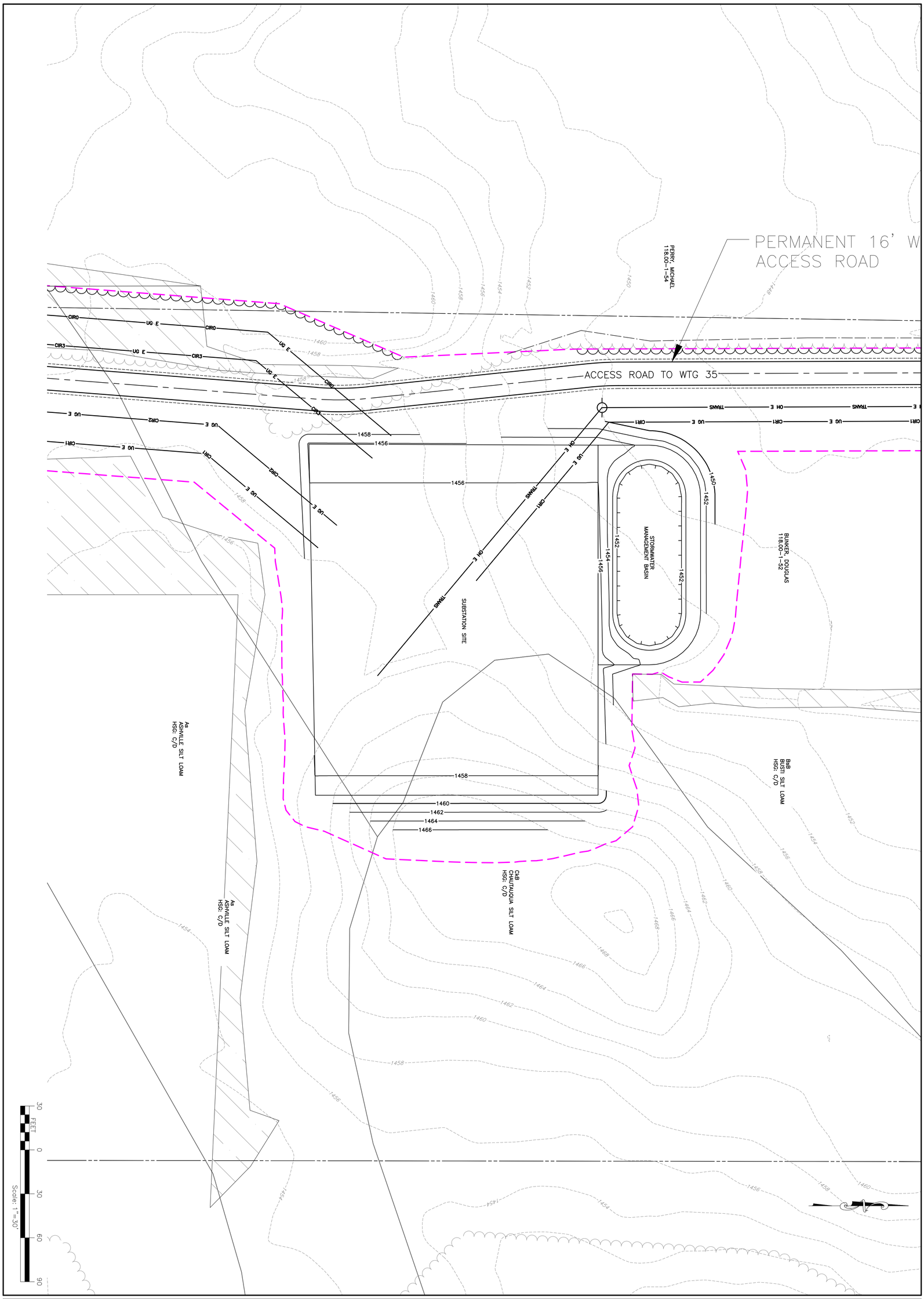

SHEET 74 OF 81

DRAWING NO. SP-7

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
SUBSTATION SITE PLAN

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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
VT, TK
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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REV	DESCRIPTION	DATE	BY
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FILE NAME: H:\Projects\150001-Ball_Hill_Wind_ENV\Eng\CAD\CUT\150001 SP-1 - SP-4.dwg
DATE/TIME: 10/14/2016 12:42:03 PM
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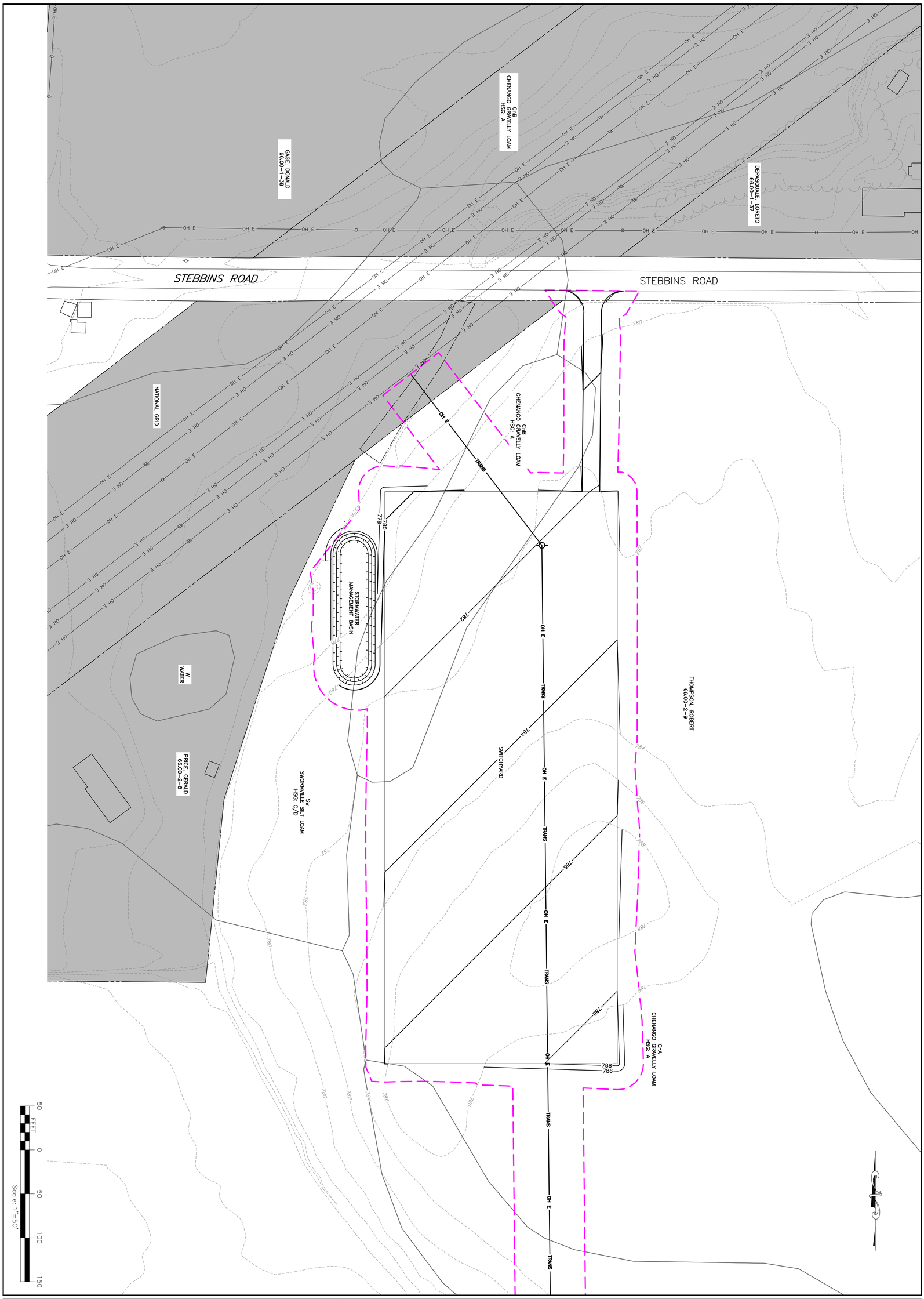

SHEET 76 OF 81

DRAWING NO.
SP-8

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
SWITCHYARD SITE PLAN

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150001
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REV	DESCRIPTION	DATE	BY
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BALL HILL WIND FARM CULVERT SUMMARY

Culvert ID	Drainage Area (ac)	Drainage Area (sq mi)	Calculated Culvert Diameter (in)	Proposed Culvert Diameter (in)	Proposed Number of Barrels	25-Year Peak Flow (cfs)
CULVERT 11-1	15.82	0.02	30		1	31.88
CULVERT 11-2	12.10	0.02	30		1	26.34
CULVERT 11-3	4.38	0.01	18		1	10.99
CULVERT 13-1	0.86	0.00	12		1	2.81
CULVERT 13-2	16.67	0.03	30		1	32.96
CULVERT 15-1	0.44	0.00	12		1	1.37
CULVERT 16-1	17.26	0.03	30		1	31.49
CULVERT 17-1	3.82	0.01	18		1	9.84
CULVERT 17-2	12.34	0.02	30		1	25.39
CULVERT 2-1	15.35	0.02	30		1	30.90
CULVERT 21-1	0.56	0.00	12		1	1.91
CULVERT 21-2	70.92	0.11	48		1	86.82
CULVERT 21-3	39.60	0.06	48		1	55.75
CULVERT 2-2	1.01	0.00	12		1	3.31
CULVERT 23-1	9.72	0.02	24		1	21.42
CULVERT 23-2	11.19	0.02	30		1	23.52
CULVERT 23-3	3.47	0.01	18		1	8.97
CULVERT 27-1	0.09	0.00	12		1	0.35
CULVERT 28-1	0.15	0.00	12		1	0.55
CULVERT 28-2	107.98	0.17	54		1	130.34
CULVERT 28-3	23.42	0.04	36		1	40.89
CULVERT 30-1	1.18	0.00	12		1	3.70
CULVERT 30-2	4.17	0.01	18		1	10.60
CULVERT 30-3	3.68	0.01	18		1	10.60
CULVERT 30-4	145.81	0.23	72		1	174.76
CULVERT 30-5	72.68	0.11	48		1	99.61
CULVERT 3-1	0.81	0.00	12		1	2.73
CULVERT 31-1A	0.04	0.00	12		1	0.14
CULVERT 31-2	0.23	0.00	12		1	0.84
CULVERT 31-3	10.07	0.02	24		1	22.57
CULVERT 31-4	3.09	0.00	18		1	7.78
CULVERT 31-5	19.67	0.03	36		1	37.67
CULVERT 31-6	6.97	0.01	24		1	14.97
CULVERT 31-7	0.76	0.00	12		1	2.30
CULVERT 3-2	4.43	0.01	18		1	11.02
CULVERT 33-1	76.96	0.12	54		1	112.14
CULVERT 33-2	8.30	0.01	24		1	19.69
CULVERT 33-3	16.57	0.03	30		1	33.99
CULVERT 33-4	50.47	0.08	48		1	81.15
CULVERT 33-5	1.43	0.00	18		1	4.49
CULVERT 34-1	10.42	0.02	24		1	21.59
CULVERT 35-1	28.15	0.04	36		1	47.08
CULVERT 35-2	11.33	0.02	30		1	23.51
CULVERT 36-1	31.92	0.05	48		1	57.63
CULVERT 36-2	309.79	0.48	84		1	316.61
CULVERT 36-3	10.81	0.02	30		1	26.14
CULVERT 36-4	914.53	1.43	96		1	427.15
CULVERT 37-1	5.68	0.01	24		1	13.52
CULVERT 39-1	5.11	0.01	24		1	12.53
CULVERT 4-1	4.44	0.01	18		1	10.29
CULVERT 5-1	8.41	0.01	24		1	16.89
CULVERT 5-2	14.09	0.02	30		1	24.91
CULVERT 5-3	3.18	0.00	18		1	7.86
CULVERT 5-4	9.23	0.01	24		1	18.89
CULVERT 5-5	7.15	0.01	24		1	18.41
CULVERT 7-1	3.29	0.01	18		1	8.79
CULVERT 8-1A	0.27	0.00	12		1	0.98
CULVERT 8-2	45.59	0.07	48		1	65.08
CULVERT 8-3	79.40	0.12	48		1	105.23
CULVERT 9-1	4.29	0.01	18		1	10.21
CULVERT 9-2	1.59	0.00	18		1	4.62

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VT, TK

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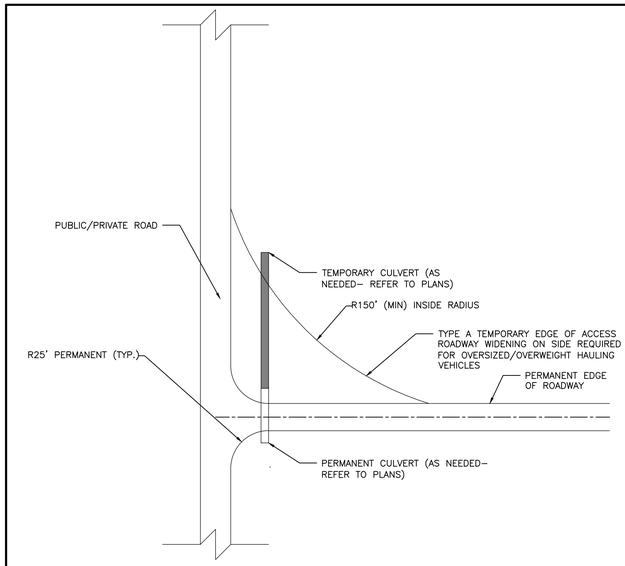
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
CULVERT DRAINAGE TABLE

DRAWING NO.
DT-1

SHEET 76 OF 81



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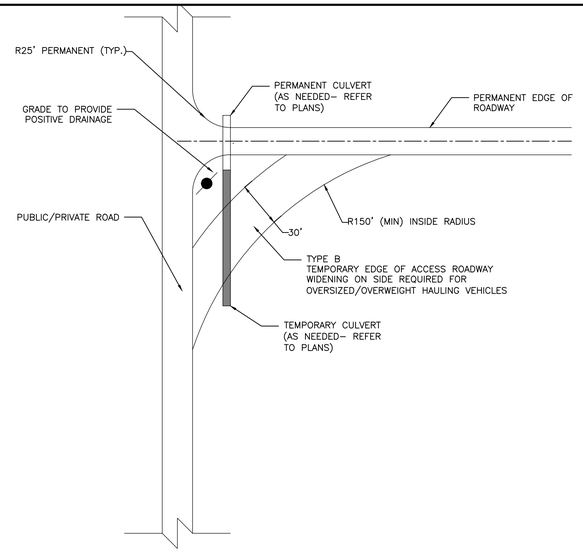

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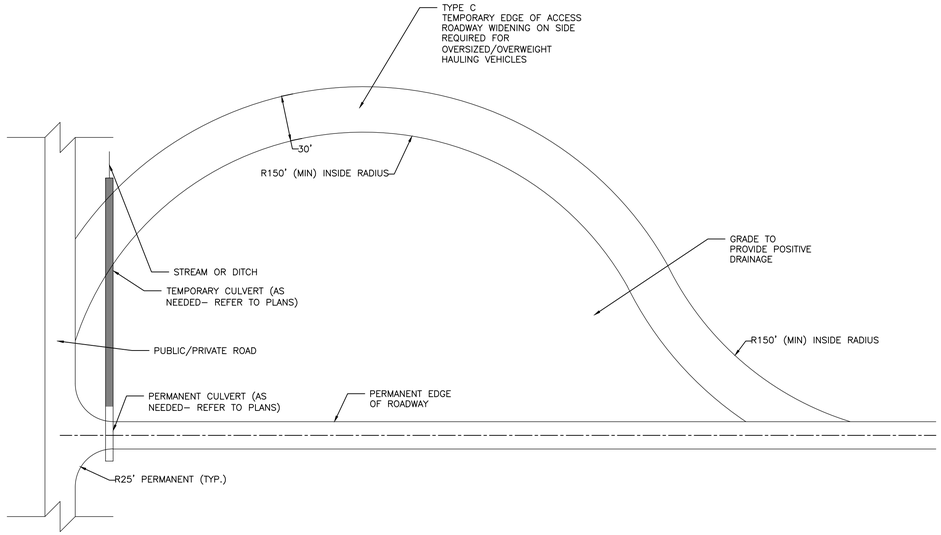

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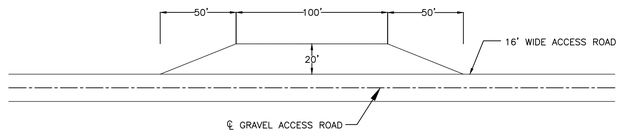

TEMPORARY PASSING LANE
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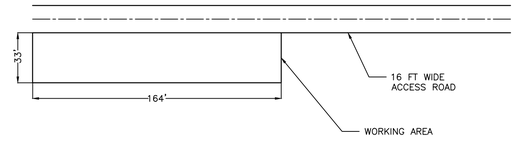

TEMPORARY CRANE BUILD AREA
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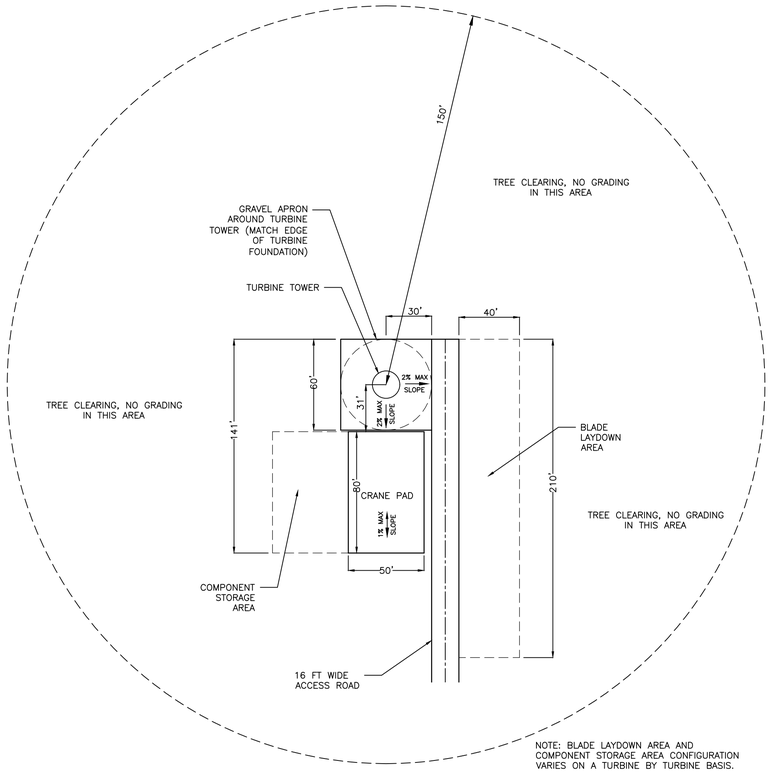
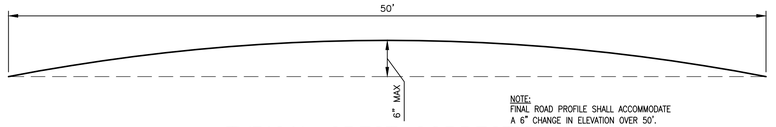


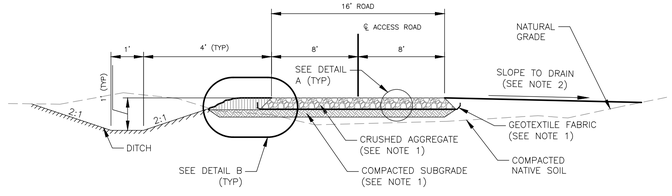
NOTE: BLADE LAYDOWN AREA AND COMPONENT STORAGE AREA CONFIGURATION VARIES ON A TURBINE BY TURBINE BASIS.

CONSTRUCTION SITE
N.T.S.

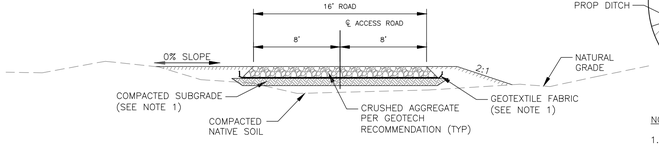


NOTE:
FINAL ROAD PROFILE SHALL ACCOMMODATE A 6" CHANGE IN ELEVATION OVER 50'.

TYPICAL CREST CORRECTION
N.T.S.

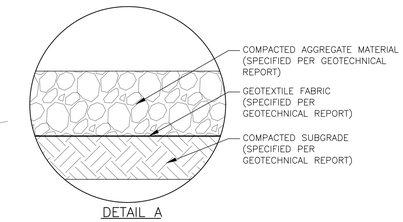


ACCESS ROAD W / DITCH

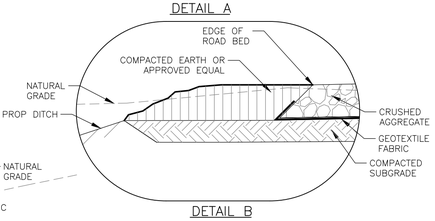


ACCESS ROAD W/O DITCH

ACCESS ROAD CROSS SECTION DETAIL: 16–FT WIDE ACCESS ROAD WITHOUT CRANE PATH
N.T.S.



DETAIL A



DETAIL B

NOTES:

1. THICKNESS OF ACCESS ROADWAY, GEOTEXTILE FABRIC, AND COMPACTED SUBGRADE SHALL BE BASED ON GEOTECHNICAL RECOMMENDATION.
2. LIMITS OF CROSS SLOPES SHALL BE:
   0% – 2% MAX FOR ACCESS ROAD DURING CONSTRUCTION
   0% – 2% MAX FOR NON–DITCH SECTION
   2% – 4% MAX FOR ACCESS ROAD AFTER CONSTRUCTION

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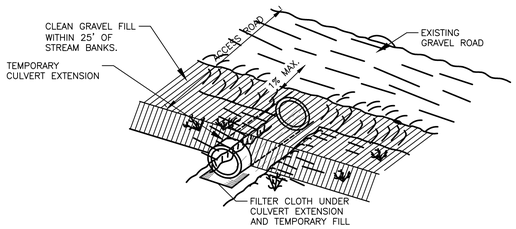
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
DETAILS-1

DRAWING NO.
DET-1

SHEET 77 OF 81

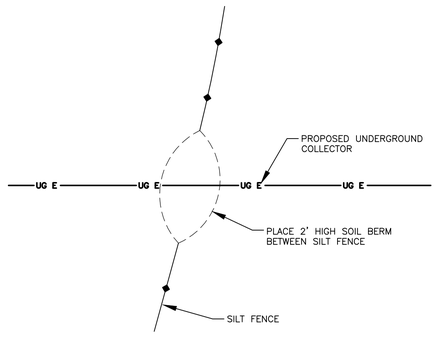


NOTES:

1. EXISTING CULVERT SHALL BE EXTENDED ON THE SIDE OF ROAD RESULTING IN THE LEAST AMOUNT OF WETLAND AND/OR STREAM IMPACTS.
2. TEMPORARY CULVERT SHALL BE INSTALLED NO SOONER THAN 4 WEEKS PRIOR TO THE CRANE CROSSING AND SHALL BE REMOVED WITHIN 5 MONTHS AFTER THE CROSSING.
3. THE CULVERT SHALL EXTEND A MINIMUM OF 1' BEYOND THE TOE OF SLOPE.
4. IN AREAS THAT HAVE LESS THAN 1' OF COVER OVER THE EXISTING CULVERT, A STEEL PLATE MAY BE UTILIZED IN CONJUNCTION WITH THE TEMPORARY CULVERT EXTENSIONS TO SPAN THE CULVERT AND PROVIDE FOR CONSTRUCTION LOADING.
5. THE MINIMUM DIAMETER OF THE TEMPORARY CULVERT SHALL EQUAL THE SIZE OF THE EXISTING CULVERT.

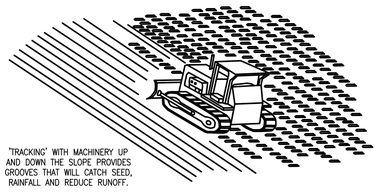
TEMPORARY CULVERT EXTENSION

N.T.S.



EROSION CONTROL CROSSING UNDERGROUND COLLECTION

N.T.S.



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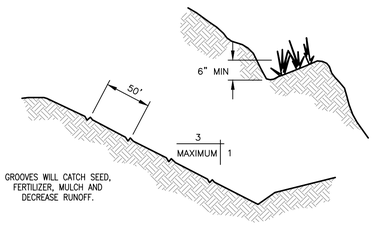
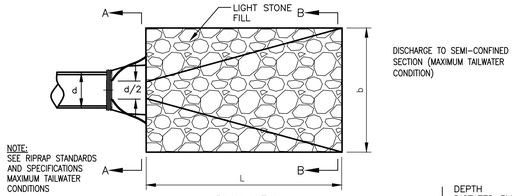


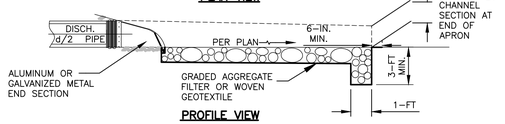
CONTOUR FURROWS

SURFACE ROUGHENING

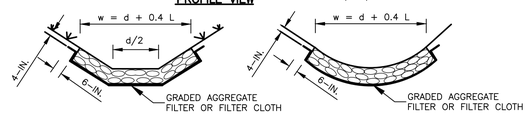
N.T.S.



PLAN VIEW



PROFILE VIEW



SECTION A–A
(AT END OF CULVERT)

SECTION B–B
(AT END OF APRON)

APPLICATION NOTES:

1. ROCK OUTLET PROTECTION SHALL BE PROVIDED AT THE INLETS AND OUTLETS OF ALL CULVERT PIPES TO REDUCE THE DEPTH, VELOCITY, AND ENERGY OF WATER SUCH THAT THE FLOW WILL NOT ERODE THE RECEIVING DOWNSTREAM REACH.

CONSTRUCTION SPECIFICATIONS:

1. SEE GRADING AND STORMWATER POLLUTION PREVENTION PLAN FOR OUTFALL INVERTS AND SURROUNDING GRADES.
2. ANY FILL ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
3. SEE DRAINAGE TABLE FOR PIPE AND OUTFALL LOCATIONS AND PIPE SIZES.
4. FILTER CLOTH SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN THE OCCASIONAL SMALL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF CLOTH OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE CLOTH. ALL OVERLAPS, WHETHER FOR REPAIRS OR JOINING TWO PIECES OF CLOTH SHALL BE A MINIMUM OF 1–FT.

MAINTENANCE NOTES:

1. INSPECT STRUCTURE AFTER HIGH FLOWS FOR EVIDENCE OF SCOUR BENEATH RIPRAP OR FOR DISLODGED STONES. REPAIRS SHOULD BE MADE IMMEDIATELY.

TYPICAL CULVERT ROCK OUTLET PROTECTION

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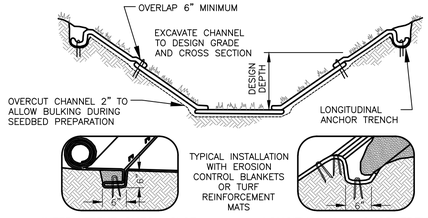
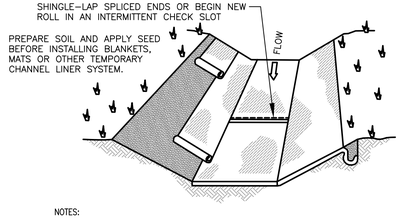


INTERMITTENT CHECK SLOT

LONGITUDINAL ANCHOR TRENCH

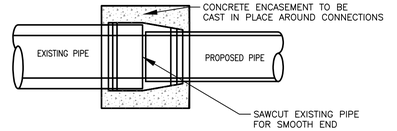


NOTES:

1. DESIGN VELOCITIES EXCEEDING 2 FT/SEC REQUIRE TEMPORARY BLANKETS, MATS OR SIMILAR LINERS TO PROTECT SEED AND SOIL UNTIL VEGETATION BECOMES ESTABLISHED.
2. GRASS–LINED CHANNELS WITH DESIGN VELOCITIES EXCEEDING 6 FT/SEC SHOULD INCLUDE TURF REINFORCEMENT MATS.

GRASS–LINED CHANNEL TYPICAL INSTALLATION

N.T.S.



CONNECT PROPOSED STORM PIPE TO EXISTING STORM PIPE

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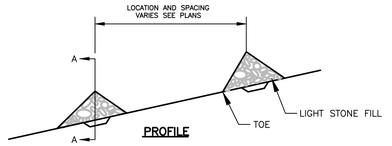

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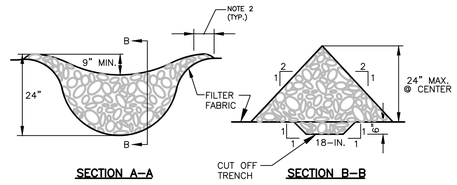


SECTION A–A

SECTION B–B

APPLICATION NOTES:

1. CHECK DAMS SHALL BE USED TO REDUCE EROSION IN DRAINAGE CHANNEL BY RESTRICTING THE VELOCITY OF FLOW IN THE CHANNEL.
2. MAXIMUM DRAINAGE AREA ABOVE THE CHECK DAM SHALL NOT EXCEED 2–ACRES.

CONSTRUCTION SPECIFICATIONS:

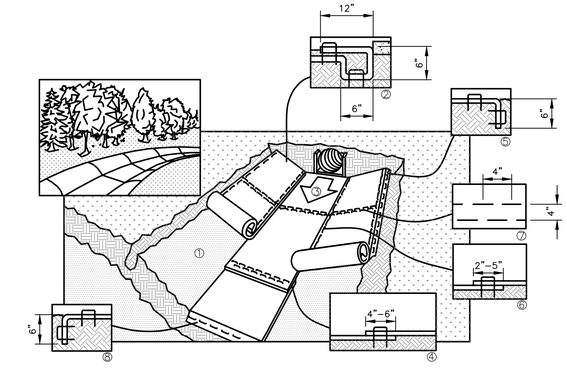
1. STONE SHALL BE PLACED ON FILTER FABRIC FOUNDATION.
2. EXTEND THE STONE A MINIMUM OF 1.5–FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
3. PROTECT CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
4. ENSURE THAT CHANNEL APPUTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAINTENANCE NOTES:

1. INSPECT CHECK DAMS ONCE A WEEK AND AFTER RAINFALLS. REMOVE SILT FROM BEHIND DAM AS NEEDED TO PERMIT FLOW THROUGH THE DAM AND PREVENT LARGE FLOWS FROM CARRYING SEDIMENT OVER THE DAM.
2. INSTALL STONE LINER IN CHANNEL UPSTREAM OF CHECK DAM IF SIGNIFICANT EROSION OCCURS.
3. REPLACE STONES AS NEEDED TO MAINTAIN THE DESIGN CROSS SECTION OF THE STRUCTURES.
4. UPON STABILIZATION OF THE SITE REMOVE CHECK DAMS SO AS NOT TO BLOCK STORM FLOW OR DRAINAGE.

CHECK DAM DETAIL

N.T.S.



CRITICAL POINTS

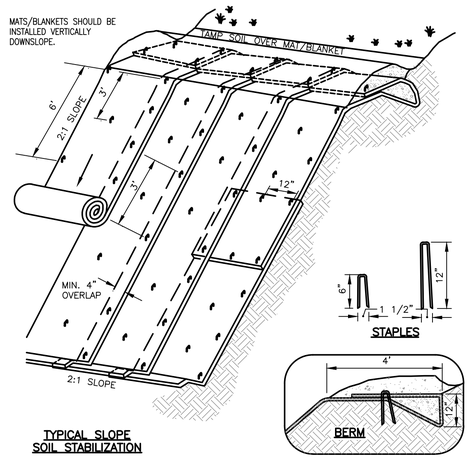
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

EROSION CONTROL BLANKET – CHANNEL INSTALLATION

N.T.S.



TYPICAL SLOPE SOIL STABILIZATION

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

EROSION BLANKETS SLOPE INSTALLATION

N.T.S.

NOTES

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWINGS.

CHANNEL INSTALLATION SPECIFICATIONS

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL–O–SEED, DO NOT SEED PREPARED AREA. CELL–O–SEED MUST BE INSTALLED WITH THE PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING OPTIONAL DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"–6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"–5" (DEPENDING ON BLANKET TYPE) AND STAPLED. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH ON THE BLANKET BEING OVERLAPPED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30' TO 40' INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
9. EROSION CONTROL BLANKETS INSTALLED WITHIN CHANNELS/SWALES/DITCHES SHALL BE NORTH AMERICAN GREEN SC–250 OR APPROVED EQUAL.

REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
MLE
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
DETAILS-2

DRAWING NO.
DET-2

SHEET 78 OF 81

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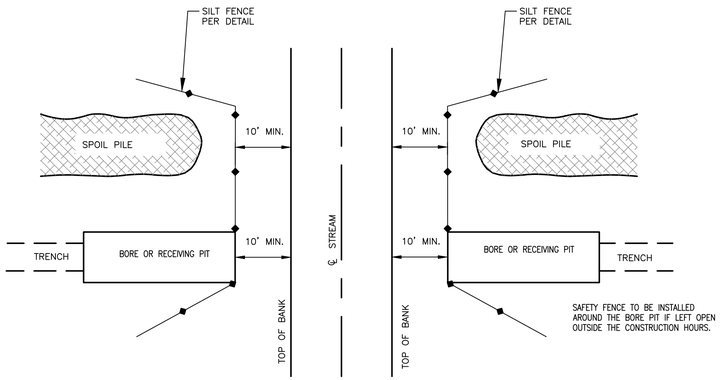
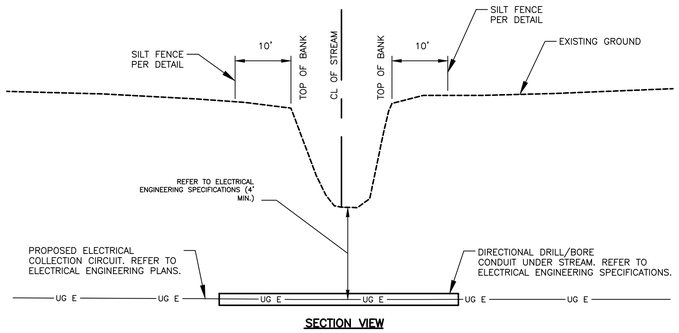


PLAN VIEW



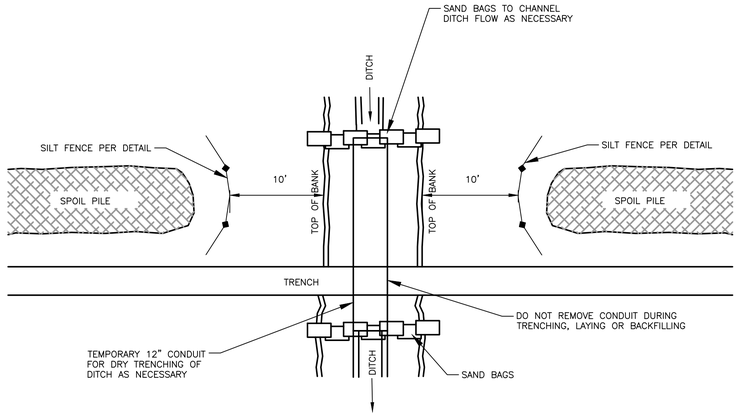
SECTION VIEW

NOTES:

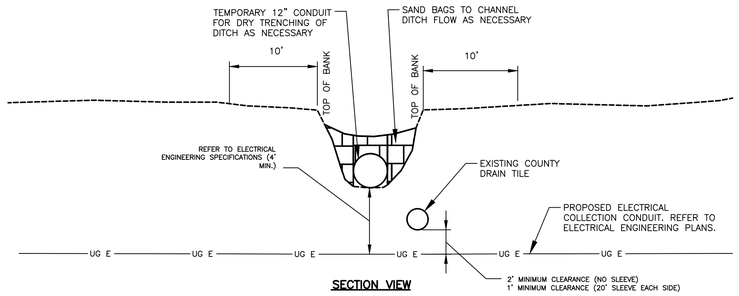
1. EXCAVATED TRENCH AND BORE/RECIEVING PIT MATERIAL SHALL BE STOCKPILED ADJACENT TO THE TRENCH, NO CLOSER THAN 10' FROM THE TOP OF BANK OF THE DITCH.
2. SILT FENCE SHALL BE INSTALLED BETWEEN THE STOCKPILED MATERIAL AND BORE/RECIEVEING PIT AND THE TOP OF BANK ON BOTH SIDES OF THE STREAM.
3. IMMEDIATELY AFTER CONSTRUCTION IS COMPLETE, PERMANENT STABILIZATION MEASURES SHALL BE APPLIED.
4. THERE SHALL BE NO DISTURBANCE TO THE STREAM DURING CONSTRUCTION.
5. REFER TO ELECTRICAL DESIGN FOR CONDUIT DEPTH AND TRENCH DETAILS.

TYPICAL EROSION CONTROL & CLEARANCE DETAIL FOR COLLECTION LINE TRENCHLESS STREAM CROSSING

N.T.S.



PLAN VIEW



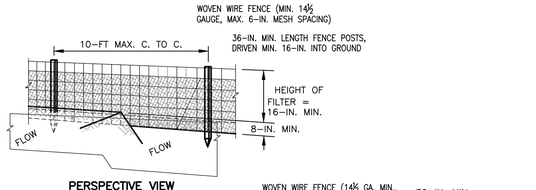
SECTION VIEW

NOTES:

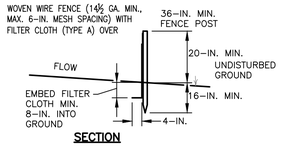
1. TEMPORARY SAND BAGS AND CONDUIT ARE TO BE INSTALLED PRIOR TO ANY CONSTRUCTION WITHIN THE LIMITS OF THE DITCH. IN THE EVENT THAT THE DITCH IS DRYING DURING CONSTRUCTION, SAND BAGS AND CONDUIT ARE NOT NECESSARY.
2. EXCAVATED TRENCH MATERIAL SHALL BE STOCKPILED ADJACENT TO THE TRENCH, NO CLOSER THAN 25' FROM THE TOP OF BANK OF THE DITCH.
3. SILT FENCE SHALL BE INSTALLED BETWEEN THE STOCKPILED MATERIAL AND THE TOP OF BANK OF THE DITCH.
4. IMMEDIATELY AFTER CONSTRUCTION IS COMPLETE, PERMANENT STABILIZATION MEASURES SHALL BE APPLIED.
5. REFER TO ELECTRICAL DESIGN FOR CONDUIT DEPTH AND TRENCH DETAILS.

TYPICAL EROSION CONTROL & CLEARANCE DETAIL FOR COLLECTION LINE OPEN CUT DITCH/TILE CROSSING

N.T.S.



PERSPECTIVE VIEW



SECTION

APPLICATION NOTES:

1. SILT FENCE SHALL BE USED IN SMALL AREAS WITH SHEET FLOW RUNOFF TO INTERCEPT SEDIMENT AND REDUCE RUNOFF VELOCITY.
2. MAXIMUM SLOPE LENGTH FOR SLOPES FLATTER THAN 5:1 SHALL BE 100 FEET.
3. MAXIMUM DRAINAGE AREA TO SILT FENCE SHALL NOT EXCEED ¼ ACRE PER 100-FT OF FENCE.

CONSTRUCTION SPECIFICATIONS:

1. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.
2. POSTS SHALL BE A MINIMUM 36-IN. LONG AND SHALL BE TYPE T OR U STEEL WEIGHING NOT LESS THAN 1.0 LBS PER SQ.FT.; OR HARDWOOD WITH A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
3. FILTER CLOTH SHALL BE FILTER X, MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL.
4. WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
5. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24-IN. AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 14½ GAUGE, 6-IN. MAXIMUM MESH SPACING.
6. PREFABRICATED UNITS SHALL BE ENVIROFENCE OR APPROVED EQUAL.

MAINTENANCE NOTES:

1. INSPECT SILT FENCE ONCE A WEEK AND AFTER RAINFALLS, REMOVE AND REPLACE THE FABRIC WHEN BULGES DEVELOP IN THE SILT FENCE.
2. MAINTENANCE SHALL BE PERFORMED AS NEEDED, REPLACE ALL SILT FENCE EVERY 9-MONTHS OR AS DIRECTED BY THE PROJECT REPRESENTATIVE.
3. UPON STABILIZATION OF THE SITE REMOVE SILT FENCE SO AS NOT TO BLOCK STORM FLOW OR DRAINAGE.

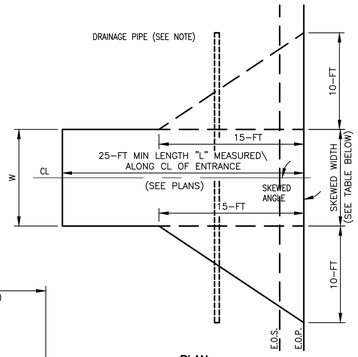
SILT FENCE DETAIL

N.T.S.

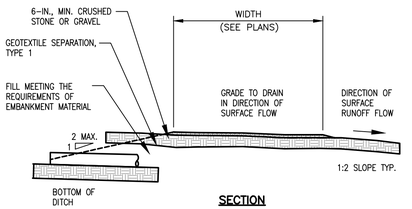
SKEWED ENTRANCE LAYOUT WIDTHS (W)

ENTRANCE TYPE	SKEW ANGLE (°)				
	60	75	90	105	120
ONE-WAY	14.0	12.5	12.0	12.5	14.0
TWO-WAY	28.0	25.0	24.0	25.0	28.0

NOTE:
FOR CORNER ANGLES NOT SHOWN IN TABLE, SEE NYSDOT "POLICY AND STANDARDS FOR ENTRANCES TO STATE HIGHWAYS, FEBRUARY 1998-IN., MINOR COMMERCIAL DRIVEWAYS.



PLAN



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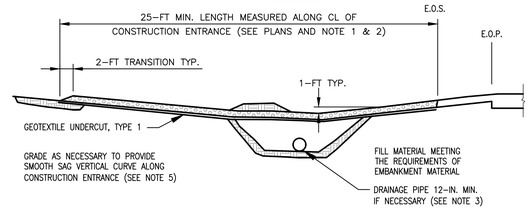

PROFILE

APPLICATION NOTES:

A. THE PURPOSE OF A STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO ADJACENT CAMPUS STREETS.

CONSTRUCTION SPECIFICATIONS:

1. MODIFICATIONS MAY BE REQUIRED TO MATCH FIELD CONDITIONS AS DIRECTED BY THE PROJECT REPRESENTATIVE.
2. A 30-FT WASH AREA SHALL BE PROVIDED CENTERED ON LOW POINT OF DRIVEWAY SAG VERTICAL CURVE. ADDITIONAL GRADING MAY BE REQUIRED TO PROVIDE WASHING AREA. WASHING SHALL BE PERFORMED AS NEEDED TO PREVENT TRACKING SEDIMENT ONTO LOCAL ROADWAYS.
3. PROPOSED DRAINAGE PIPES SHALL BE SIZED WITH SUFFICIENT CAPACITY TO CARRY DITCH FLOWS. ALTERNATE WAYS OF TRANSPORTING DITCH DRAINAGE ACROSS CONSTRUCTION ENTRANCES MAY BE PROPOSED BY CONTRACTOR FOR APPROVAL BY THE PROJECT REPRESENTATIVE.
4. THE CONTRACTOR SHALL GRADE TO PREPARE AND SMOOTH ORIGINAL GROUND FOR PLACEMENT OF 0.50-FT OF #3 CRUSHED STONE ENTRANCE MATERIAL UP TO THE EDGE OF PAVEMENT.
5. THE CONTRACTOR SHALL RESTORE LAWN AND ROADWAY SHOULDER TO ORIGINAL CONDITION AT NO ADDITIONAL EXPENSE TO THE OWNER.

MAINTENANCE NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS THE TRACKING OF SEDIMENT ONTO THE CAMPUS ROADWAYS. THIS CAN BE DONE BY PROVIDING TOP DRESSING OF ADDITIONAL AGGREGATE.
2. ALL SEDIMENT SPILLED, DROPPED, OR WASHED ONTO THE CAMPUS OR PUBLIC ROADWAYS SHOULD BE REMOVED IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE

N.T.S.

REV	DESCRIPTION	DATE	BY
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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
MLE
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

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PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
DETAILS-3

DRAWING NO.
DET-3

SHEET 79 OF 81

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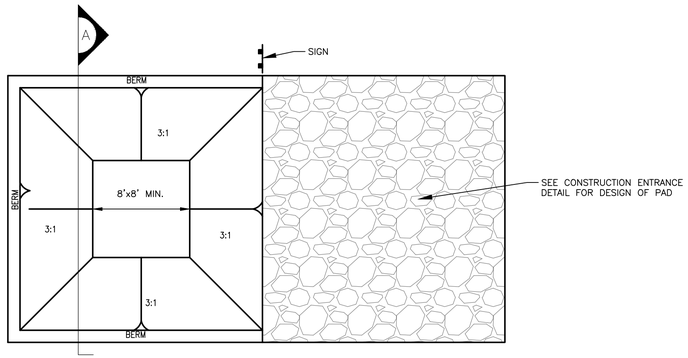
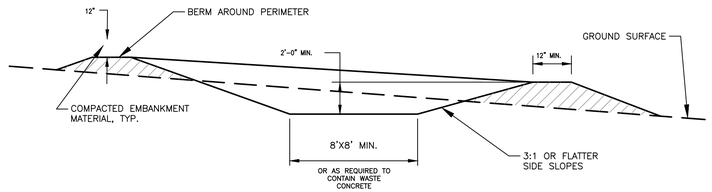


PLAN VIEW



SECTION A

CONCRETE WASHOUT AREA INSTALLATION NOTES:

1. CONCRETE WASHOUT AREAS ARE TO BE INSTALLED AT EACH WTG PAD LOCATION, O & M BUILDING SITE, SUBSTATION SITE, LAYDOWN AREA AND WHEREVER ELSE CONCRETE IS USED FOR THE PROJECT.
2. THE CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON THE SITE.
3. VEHICLE TRACKING CONTROL IS REQUIRED AT THE ACCESS POINT.
4. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
5. EXCAVATED MATERIAL SHALL BE UTILIZED IN PERIMETER BERM CONSTRUCTION.

CONCRETE WASHOUT AREA MAINTENANCE NOTES:

1. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
2. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.
3. WHEN THE CONCRETE WASHOUT AREA IS REMOVED, COVER THE DISTURBED AREA WITH TOPSOIL, DRILL SEED AND CRIMP MULCH OR OTHERWISE STABILIZE IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

CONCRETE WASHOUT AREA

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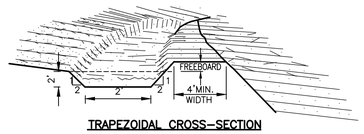

TRAPEZOIDAL CROSS-SECTION

CONSTRUCTION SPECIFICATIONS

1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE DIVERSION.
2. THE DIVERSION SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN, AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
3. FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE DIVERSION.
4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIVERSION.
5. STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES.

5.A. FOR DESIGN VELOCITIES OF LESS THAN 3.5 FT. PER. SEC., SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY DIVERSIONS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE DIVERSION DURING THE ESTABLISHMENT OF THE VEGETATION.

5.B. FOR DESIGN VELOCITIES OF MORE THAN 3.5 FT. PER. SEC., THE DIVERSION SHALL BE STABILIZED WITH SOD, WITH SEEDING PROTECTED BY JUTE OR EXCELSIOR MATTING OR WITH SEEDING AND MULCHING INCLUDING TEMPORARY DIVERSION OF THE WATER UNTIL THE VEGETATION IS ESTABLISHED.

DIVERSION SWALE DETAIL

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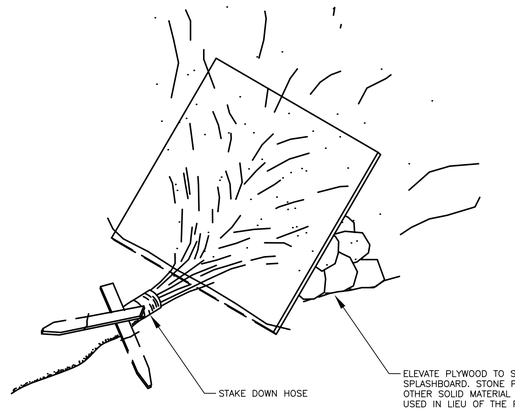
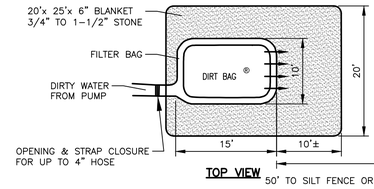
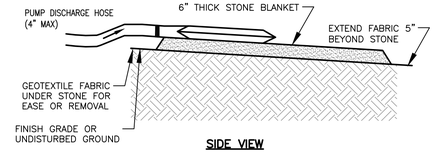


DEWATERING ENERGY DISSAPATOR OUTLET OPTION

N.T.S.



TOP VIEW



SIDE VIEW

NOTES:

1. DIRT BAG MATERIAL BASED ON PARTICLE SIZE IN DIRTY WATER, I.E. FOR COARSE PARTICLES A WOVEN MATERIAL; FOR SILTS/CLAYS A NON-WOVEN MATERIAL.
2. DO NOT OVER PRESSURIZE DIRT BAG OR USE BEYOND CAPACITY.
3. LOCATE DISCHARGE SITE ON FLAT UPLAND AREAS AS FAR AWAY AS POSSIBLE FROM STREAMS, WETLANDS, OTHER RESOURCES AND POINTS OF CONCENTRATED FLOW.
4. DOWN GRADIENT RECEIVING AREA MUST BE WELL VEGETATED OR OTHERWISE STABLE FROM EROSION. E.G. FOREST FLOOR OR COARSE GRAVEL/STONE.
5. DISCHARGE NOT PERMITTED WITHIN 25' OF A STREAM OR WETLAND. CONSULT DEP IF STRUCTURE MUST BE WITHIN 75' OF STREAM OR WATER BODY. SECONDARY CONTAINMENT MAY BE NECESSARY.

PUMPED DISCHARGE SEDIMENT CONTROL DEVICE ("DIRT BAG")

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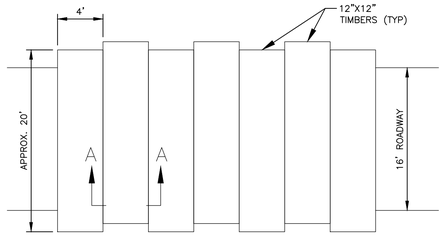
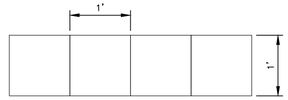


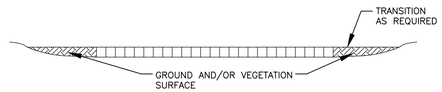
TYPICAL PLAN VIEW

NOTES:

1. TO BE INSTALLED IF NECESSARY TO PREVENT RUTTING, TO ACCESS STRUCTURES.
2. THIS DETAIL SHOWS TYPICAL DIMENSIONS. SOME CONTRACTORS SWAMP MATS ARE DIMENSIONALLY DIFFERENT FROM WHAT IS SHOWN HERE.
3. DEPENDENT ON SITE CONDITIONS, MULTIPLE LAYERS OF SWAMP MATS MAT BE INSTALLED.



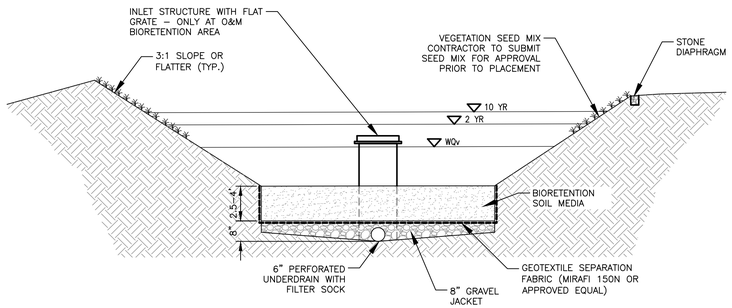
SECTION A-A TYPICAL MAT SECTION



TYPICAL SECTION VIEW

TYPICAL SWAMP MAT DETAIL

N.T.S.

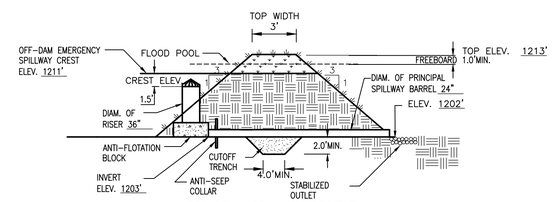


SOIL MEDIA
PER NYS STORMWATER DESIGN MANUAL

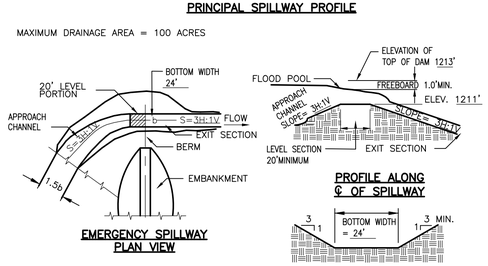
PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0%
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (P_2O_5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (K_2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	≤ 500 PPM
CLAY	10 TO 25%
SILT	30 TO 55%
SAND	35 TO 60%

BIORETENTION AREA DETAIL

N.T.S.



PRINCIPAL SPILLWAY PROFILE



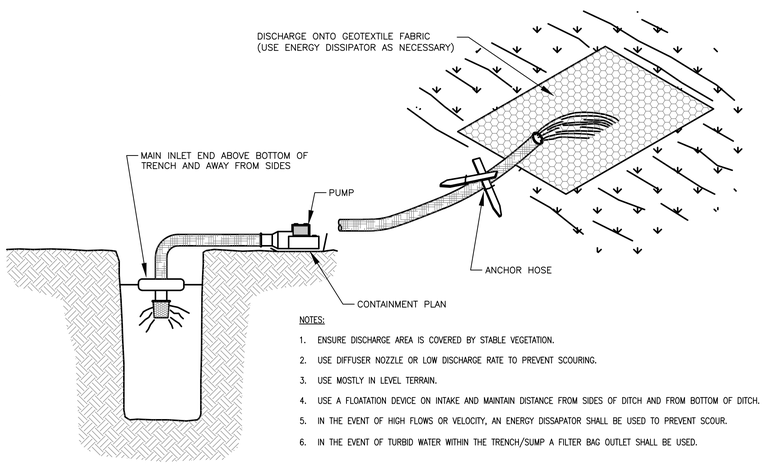
EMERGENCY SPILLWAY PLAN VIEW

PROFILE ALONG ℄ OF SPILLWAY

CROSS SECTION AT CONTROL SECTION

SEDIMENT BASIN DETAIL

N.T.S.



NOTES:

1. ENSURE DISCHARGE AREA IS COVERED BY STABLE VEGETATION.
2. USE DIFFUSER NOZZLE OR LOW DISCHARGE RATE TO PREVENT SCOURING.
3. USE MOSTLY IN LEVEL TERRAIN.
4. USE A FLOATATION DEVICE ON INTAKE AND MAINTAIN DISTANCE FROM SIDES OF DITCH AND FROM BOTTOM OF DITCH.
5. IN THE EVENT OF HIGH FLOWS OR VELOCITY, AN ENERGY DISSAPATOR SHALL BE USED TO PREVENT SCOUR.
6. IN THE EVENT OF TURBID WATER WITHIN THE TRENCH/SUMP A FILTER BAG OUTLET SHALL BE USED.

DEWATERING OPERATION WITH SURFACE STABILIZED OUTLET OPTION

N.T.S.

REV	DESCRIPTION	DATE	BY
7			
6			
5			
4			
3			
2			
1	PER NYS DEC		

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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY

DRAWN BY
MLE
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

FISHER ASSOCIATES
WWW.FISHERASSOC.COM

PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
DETAILS-4

DRAWING NO.
DET-4

SHEET 80 OF 81

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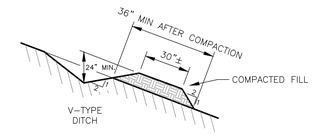
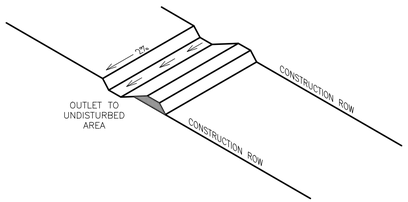


SPACING	
SLOPE	DISTANCE
10%	80 FEET
15%	60 FEET
20%	45 FEET



APPLICATION NOTES:

1. THE PRIMARY PURPOSE OF SLOPE BREAKERS IS TO LIMIT THE ACCUMULATION OF EROSIVE VELOCITY OF WATER BY DIVERTING SURFACE RUNOFF AT PRE-DESIGNED INTERVALS.
2. SLOPE BREAKERS SHALL BE PLACED ALONG LONG NARROW SLOPING AREAS THAT ARE LESS THAN 100-FT IN WIDTH AND SHALL BE SPACED IN ACCORDANCE WITH THE CHART SHOWN ABOVE.

CONSTRUCTION SPECIFICATIONS:

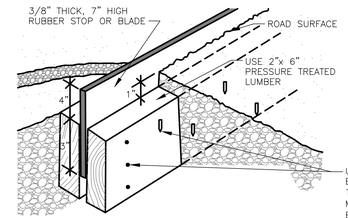
1. DISK OR STRIP THE SOD FROM THE BASE FOR THE CONSTRUCTED RIDGE BEFORE PLACING FILL.
2. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
3. THE OUTLET SHALL BE LOCATED ON AN UNDISTURBED AREA. FIELD SPACING WILL BE ADJUSTED TO USE THE MOST STABLE OUTLET AREAS. OUTLET PROTECTION WILL BE PROVIDED WHEN NATURAL AREAS ARE NOT ADEQUATE.

MAINTENANCE NOTES:

1. PERIODICALLY INSPECT WATER BARS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.

SLOPE BREAKER DETAIL

NOT TO SCALE



SPACING	
SLOPE	DISTANCE
10%	80 FEET
15%	60 FEET
20%	45 FEET

APPLICATION NOTES:

1. THE PRIMARY PURPOSE OF RUBBER BARS IS TO LIMIT THE ACCUMULATION OF EROSIVE VELOCITY OF WATER BY DIVERTING SURFACE RUNOFF AT PRE-DESIGNED INTERVALS.
2. RUBBER BARS SHALL BE PLACED ALONG LONG NARROW SLOPING AREAS THAT ARE LESS THAN 100-FT IN WIDTH AND SHALL BE SPACED IN ACCORDANCE WITH THE CHART SHOWN ABOVE.

CONSTRUCTION SPECIFICATIONS:

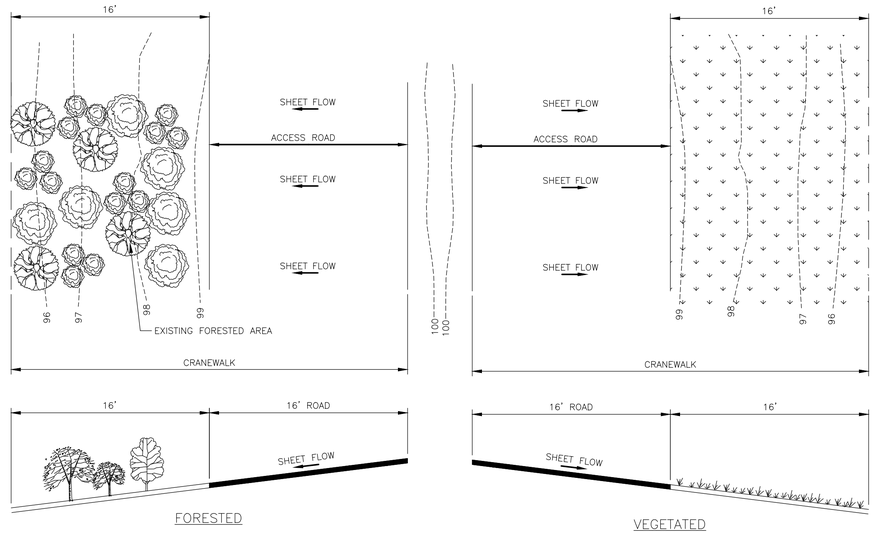
1. DISK OR STRIP THE SOD FROM THE BASE FOR THE CONSTRUCTED RIDGE BEFORE PLACING FILL.
2. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
3. THE OUTLET SHALL BE LOCATED ON AN UNDISTURBED AREA. FIELD SPACING WILL BE ADJUSTED TO USE THE MOST STABLE OUTLET AREAS. OUTLET PROTECTION WILL BE PROVIDED WHEN NATURAL AREAS ARE NOT ADEQUATE.

MAINTENANCE NOTES:

1. PERIODICALLY INSPECT RUBBER BARS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.

RUBBER BAR DETAIL

NOT TO SCALE

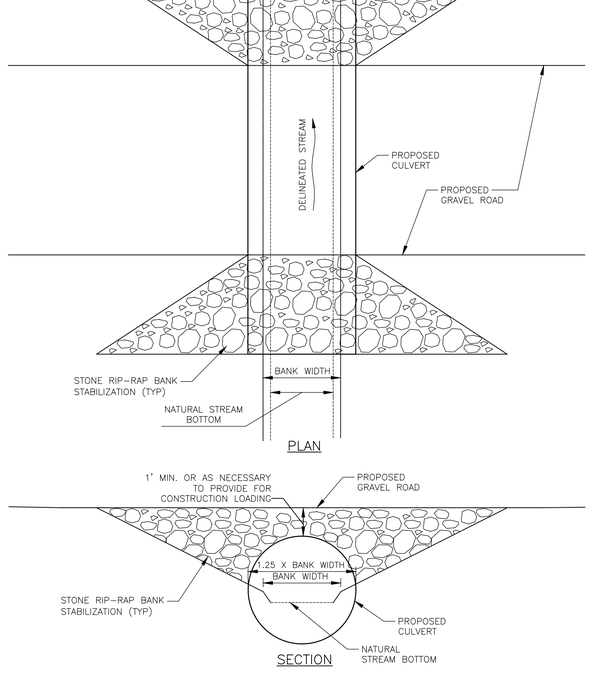


NOTES:

1. ROAD MUST BE GENERALLY PARALLEL TO THE CONTOURS OF THE SLOPE AND GRADED TO MAINTAIN SHEET FLOW TO THE FILTER STRIP.
2. IF FILTER STRIP AREA IS DISTURBED DURING CONSTRUCTION, AREA SHALL BE DECOMPACTED, TOPSOIL SHALL BE INSTALLED AND SEEDED.
3. FILTER STRIP SHALL REMAIN VEGETATED FOR THE LIFE OF THE PROJECT.
4. FILTER STRIP WIDTH SHALL BE EQUAL TO OR GREATER THAN THE WIDTH OF THE IMPERVIOUS AREAS DRAINING TO IT.

FILTER STRIP DETAIL

N.T.S.



PERMANENT CULVERT AT REGULATED STREAM CROSSINGS

NOT TO SCALE

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DATE/TIME: 10/17/2016 9:54:13 AM
USER: Steven Mellott

REV	DESCRIPTION	DATE	BY
7			
6			
5			
4			
3			
2			
1			

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FA PROJECT NO.
150001
PROJECT MANAGER
P. McCARTHY
DRAWN BY
MLE
SCALE
AS SHOWN
ISSUE DATE
OCT. 2016

FISHER ASSOCIATES
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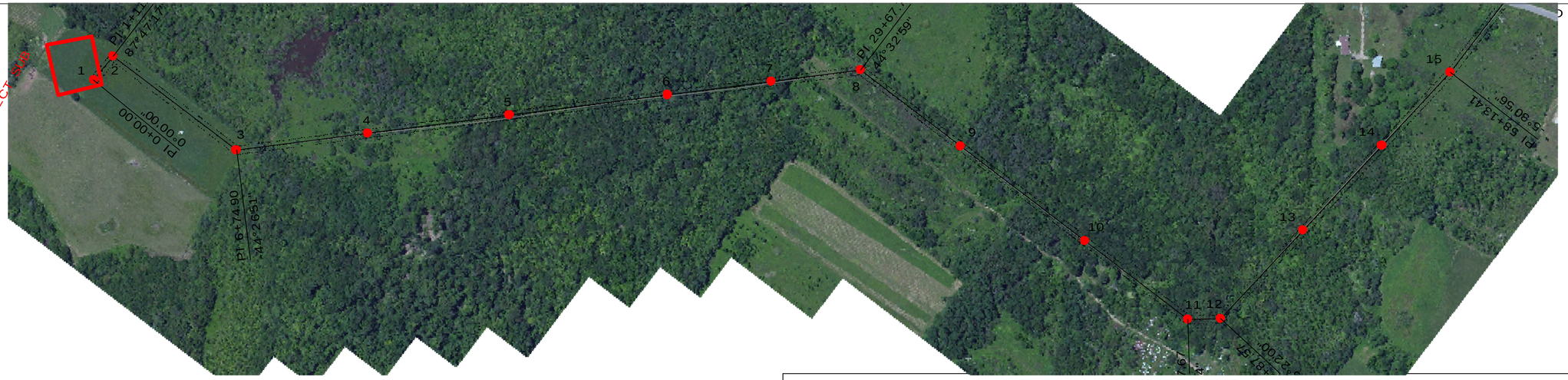
PROJECT
BALL HILL WIND FARM
TOWNS OF HANOVER & VILLENOVA
CHAUTAUQUA COUNTY, NY
PRELIMINARY PLANS

TITLE OF DRAWING
DETAILS-5

DRAWING NO.
DET-5

SHEET 81 OF 81

C-2 Project Drawings – Transmission Portion



200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE

1 STA=0+00.40 HT=61.00 ELE=1453.11 EMBED LEN=11.00
STA=0+11.41 HT=70.00 ELE=1450.16 EMBED LEN=10.00
3 STA=6+74.90 HT=74.50 ELE=1438.63 EMBED LEN=10.50
4 STA=11+58.89 HT=56.50 ELE=1454.67 EMBED LEN=8.50
5 STA=16+78.03 HT=65.50 ELE=1433.86 EMBED LEN=9.50
6 STA=22+59.79 HT=65.50 ELE=1446.00 EMBED LEN=9.50
7 STA=26+39.60 HT=56.50 ELE=1436.87 EMBED LEN=8.50
8 STA=29+67.74 HT=65.50 ELE=1426.02 EMBED LEN=9.50
9 STA=34+26.47 HT=65.50 ELE=1423.74 EMBED LEN=9.50
10 STA=39+95.26 HT=65.50 ELE=1404.00 EMBED LEN=9.50
11 STA=44+67.67 HT=56.50 ELE=1392.00 EMBED LEN=8.50
STA=45+87.57 HT=56.50 ELE=1385.86 EMBED LEN=8.50
13 STA=50+25.28 HT=65.50 ELE=1376.80 EMBED LEN=9.50

110.75 563.74 483.99 519.14 581.76 379.81 328.14 458.74 568.79 472.41 119.84 437.71

GUYED STRUCTURE
GUYED STRUCTURE
GUYED STRUCTURE
GUYED STRUCTURE
GUYED STRUCTURE

PI 0°00'00"
PI 87°47'17"
PI -44°26'51"
PI 44°32'59"
57'44"
2'00"

1800 1750 1700 1650 1600 1550 1500 1450 1400 1350

-2+50 0+00 2+50 5+00 7+50 10+00 12+50 15+00 17+50 20+00 22+50 25+00 27+50 30+00 32+50 35+00 37+50 40+00 42+50 45+00 47+50 50+00

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	ISSUE	DATE	DESCRIPTION	DRAWN	DESIGN	CHK	APP'D
A	80411		RES 10% DESIGN	JTL	JTL	JTL	CLC
PURPOSE			RES DESIGN				

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PROJECT NO: WTG LAYOUT: NRAXXXXXX

RES AMERICA CONSTRUCTION INC.
111TH W 125TH PL, NEW YORK, NY 10026
TELEPHONE (303) 339-1100 FAX (303)

BALL HILL - WIND ENERGY PROJECT

STA -2+50 TO STA 50+29
STR 1 TO STR 13

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

1 OF 7

NOTE BLOCK:

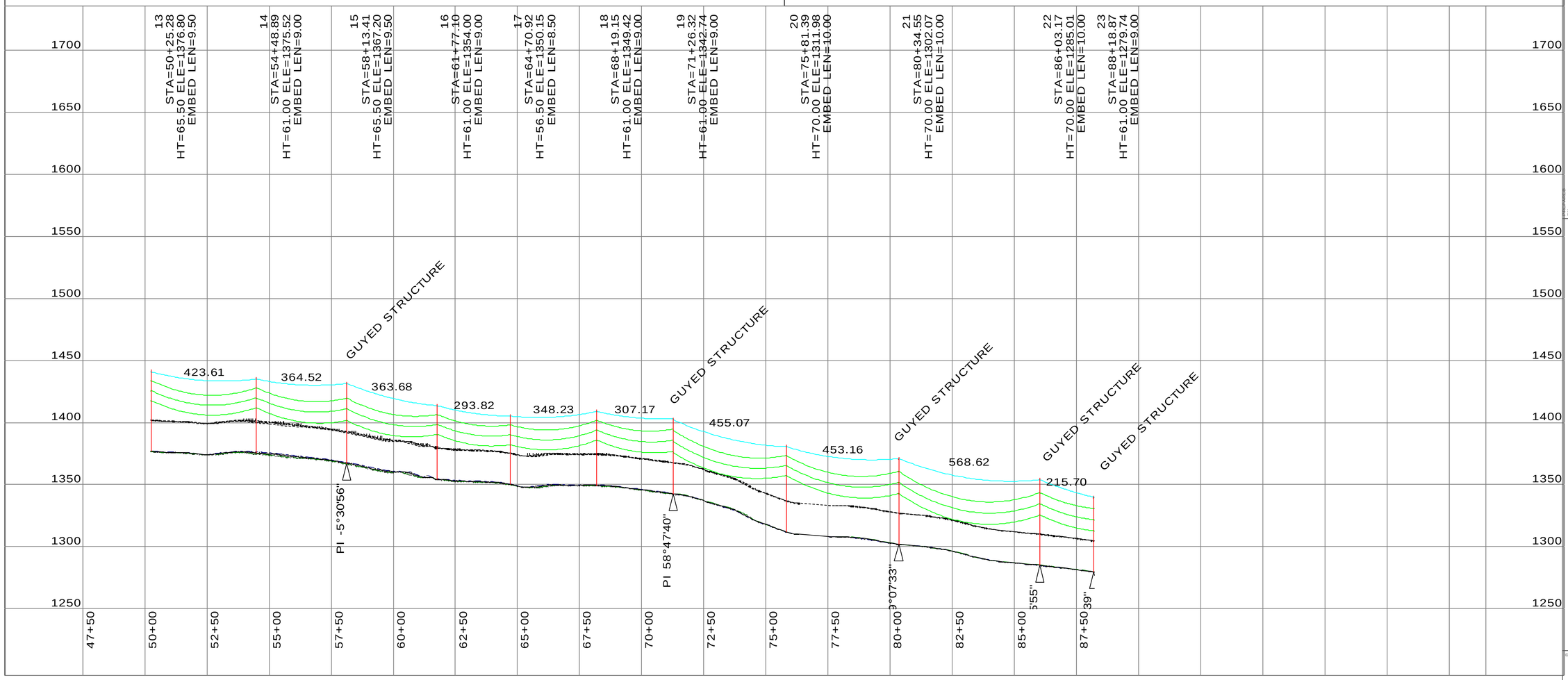
PLS-CADD DRAWING

200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE



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ISSUE	DATE	DESCRIPTION	DRAWN	CHK	APPR
A	8041	RES 10% DESIGN	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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PROJECT NO.

WTG LAYOUT: NGAXXXXXX

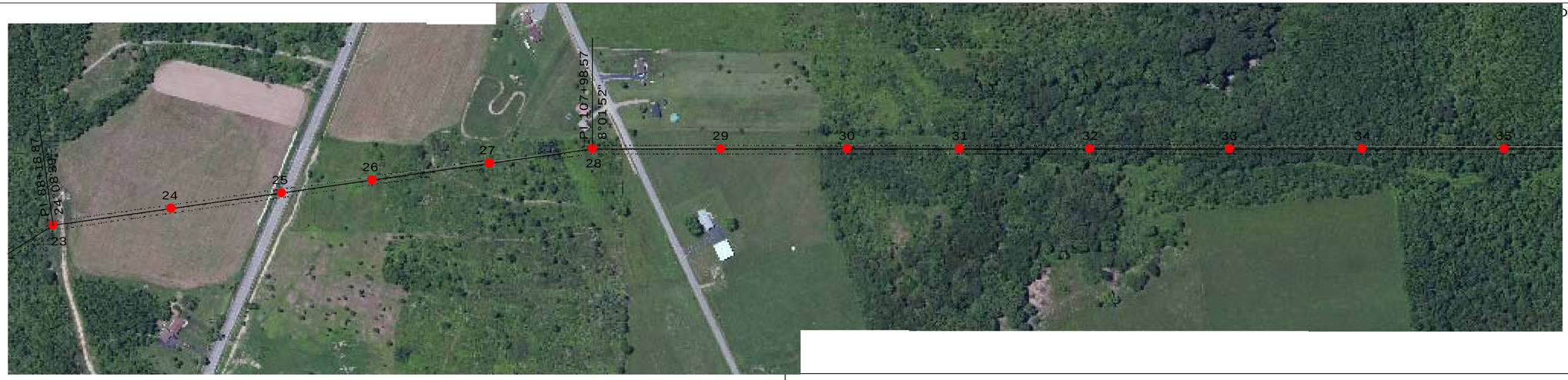
RES AMERICA CONSTRUCTION, INC.
11101 W 120TH AVE., SUITE 400 BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

BALL HILL - WIND ENERGY PROJECT

STA 47+50 TO STA 88+22
STR 13 TO STR 23

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

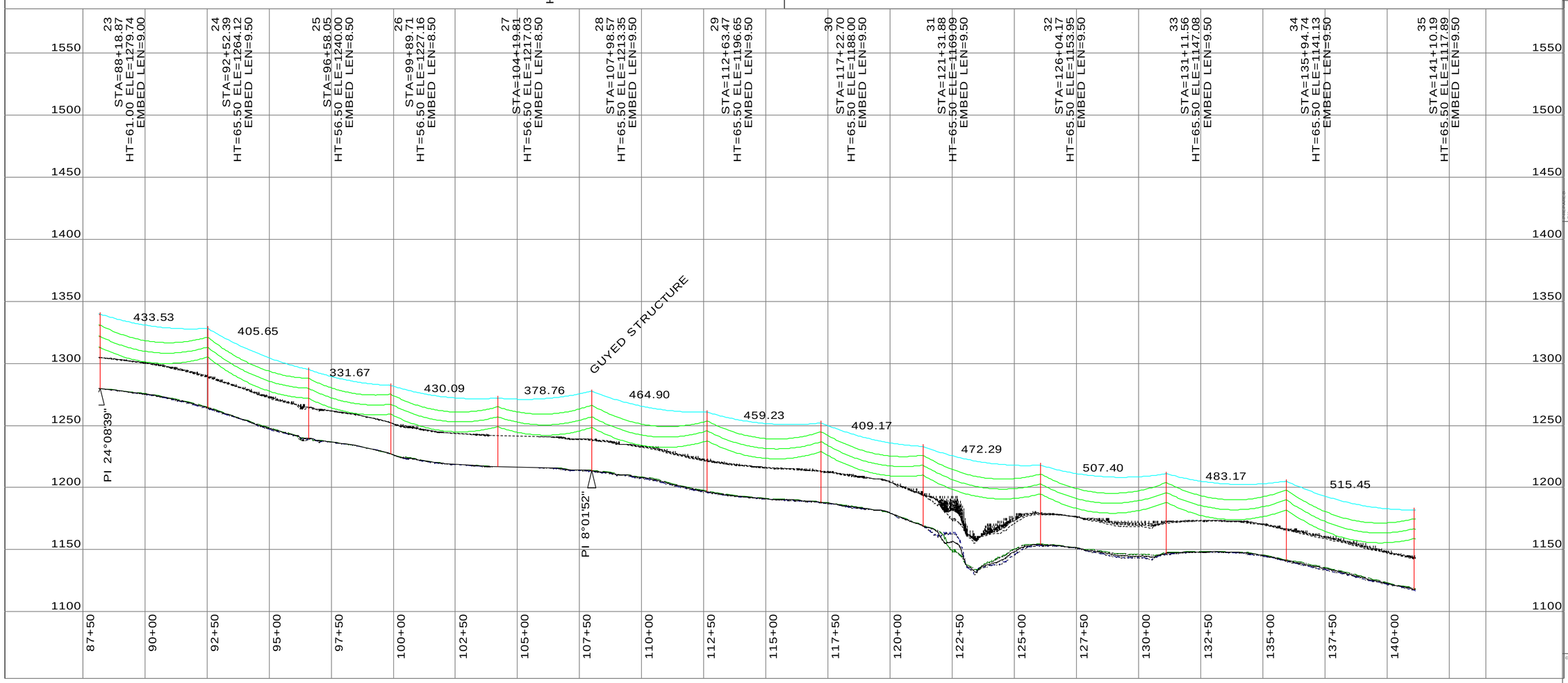


200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE



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ISSUE	DATE	DESCRIPTION	DRAWN	CHK	APPR
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PURPOSE: RES DESIGN
COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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RES AMERICA CONSTRUCTION, INC.
11101 W 120TH AVE., SUITE 400 BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

BALL HILL - WIND ENERGY PROJECT

STA 87+50 TO STA 141+13
STR 23 TO STR 35

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

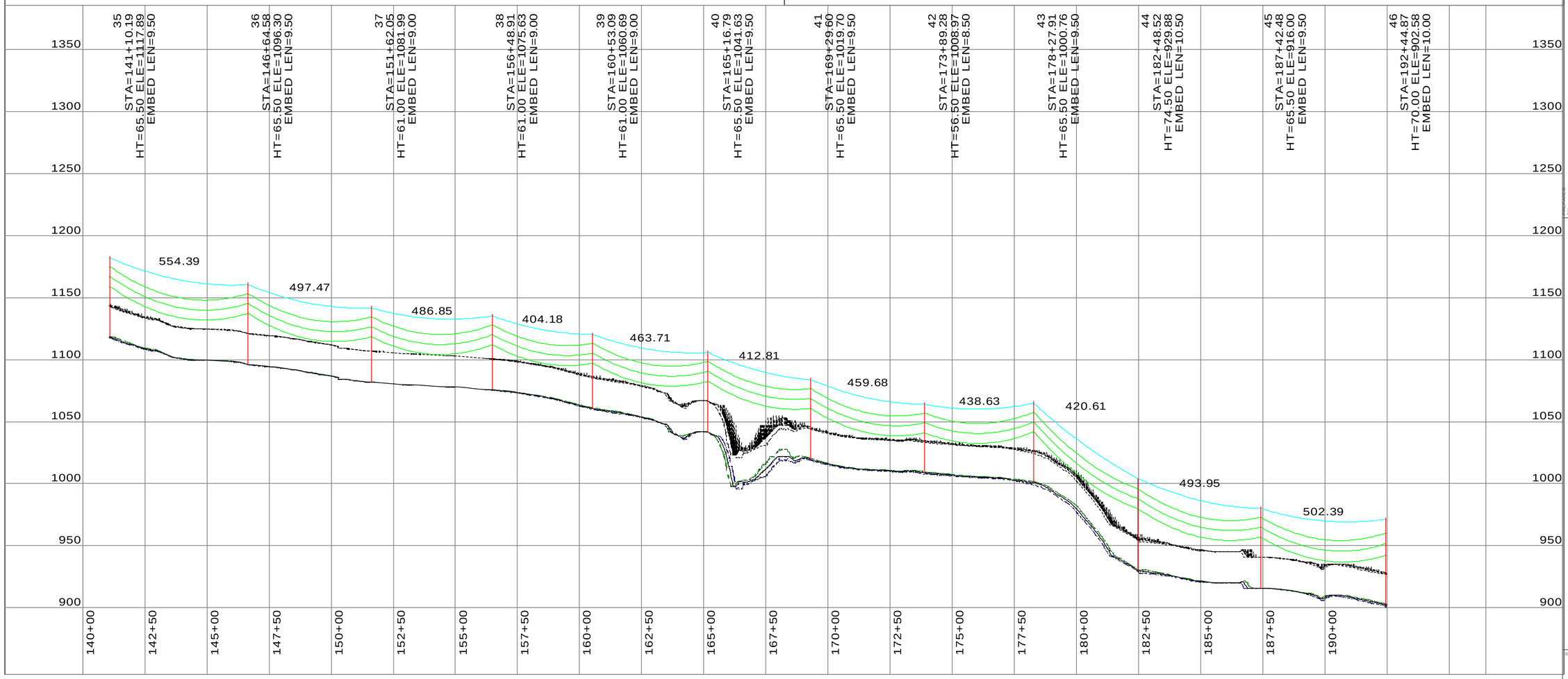
NOTE BLOCK:

200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE



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ISSUE	DATE	DESCRIPTION	DRAWN	DESIGN	CHK	APPR
A	8041	RES 10% DESIGN	JTL	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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11101 W 120TH AVE., SUITE 400 BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

BALL HILL - WIND ENERGY PROJECT

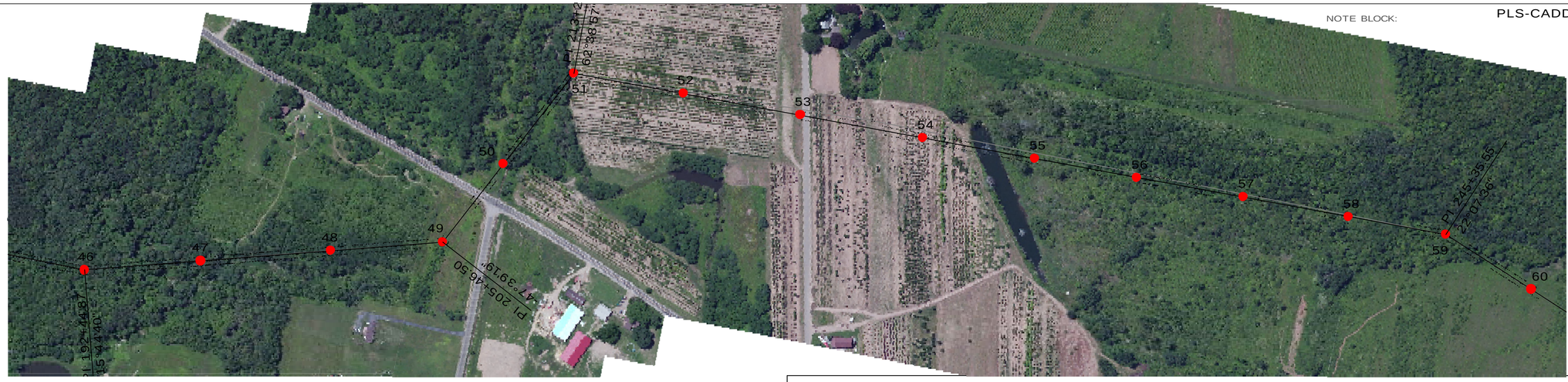
STA 140+00 TO STA 192+48
STR 35 TO STR 46

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

PLS-CADD DRAWING

NOTE BLOCK:

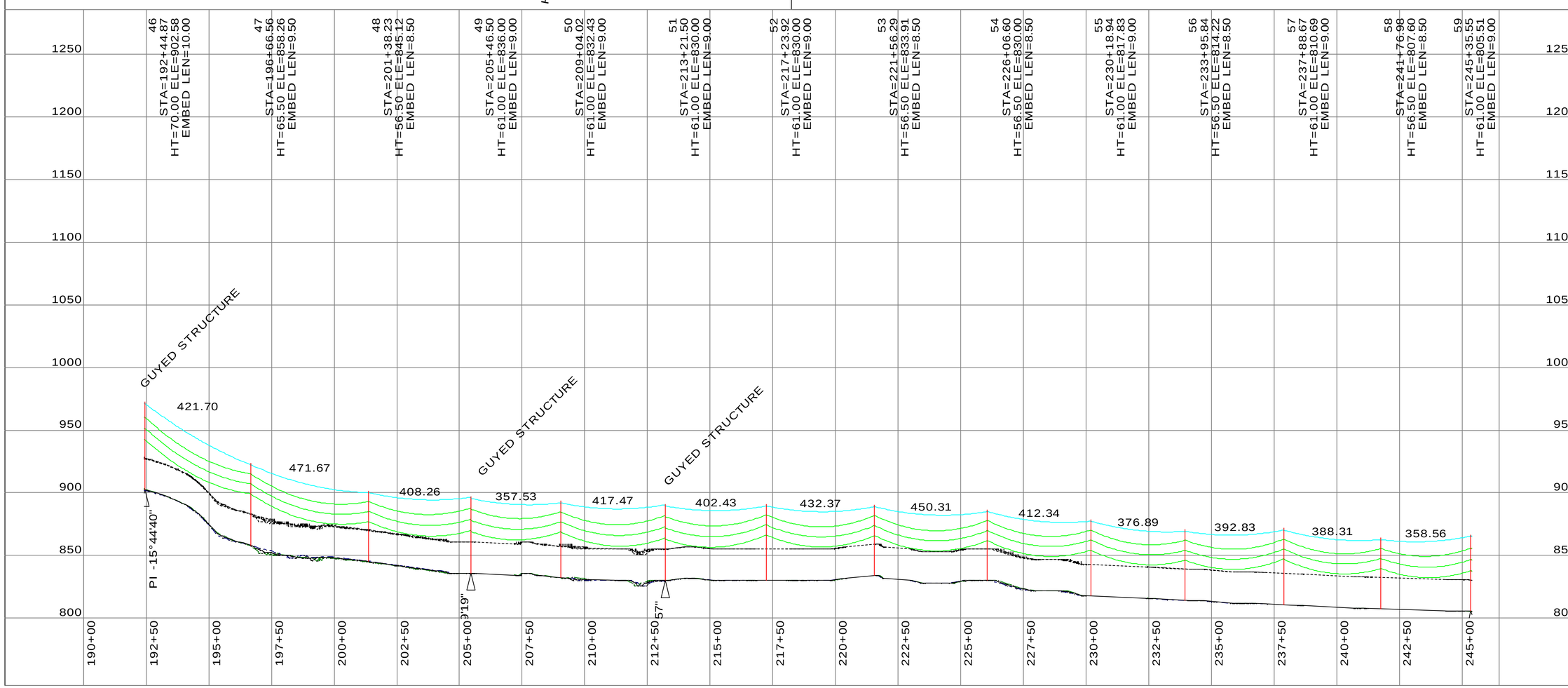


200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE



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ISSUE	DATE	DESCRIPTION	DRAWN	CHK	APPR
A	80416	RES 10% DESIGN	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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RES AMERICA CONSTRUCTION, INC.
11101 W 120TH AVE., SUITE 400 BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

BY:

BALL HILL - WIND ENERGY PROJECT

STA 190+00 TO STA 245+39
STR 46 TO STR 59

CHAUTAUQUA COUNTY, NEW YORK

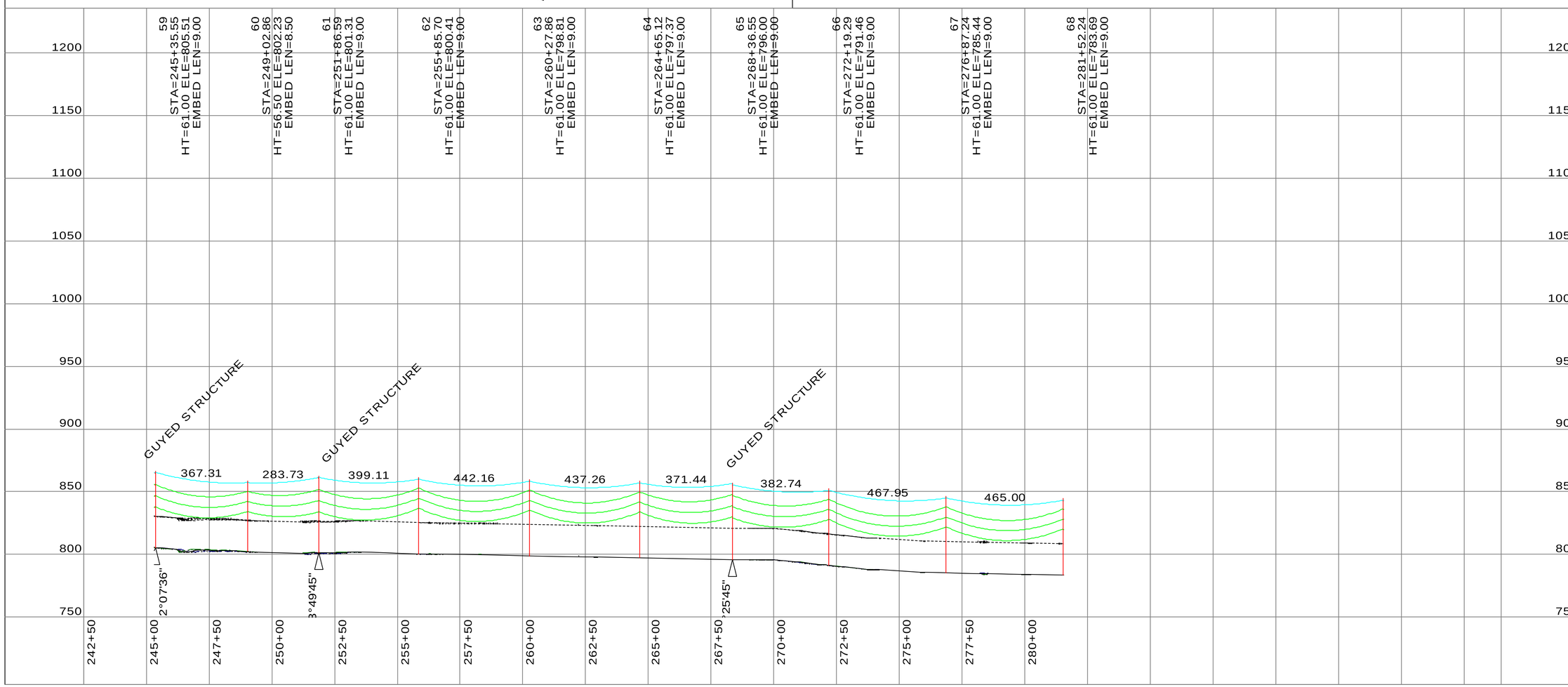
DRAWING NUMBER:

200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE



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ISSUE	DATE	DESCRIPTION	DRAWN	CHK	APPR
A	8041	RES 10% DESIGN	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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PROJECT NO.

WTG LAYOUT NO. XXXXXX

RES AMERICA CONSTRUCTION, INC.
11101 W 120TH AVE., SUITE 400 BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

BY:

BALL HILL - WIND ENERGY PROJECT

STA 242+50 TO STA 281+56
STR 59 TO STR 68

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

6 OF 7

NOTE BLOCK:

PLS-CADD DRAWING

200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
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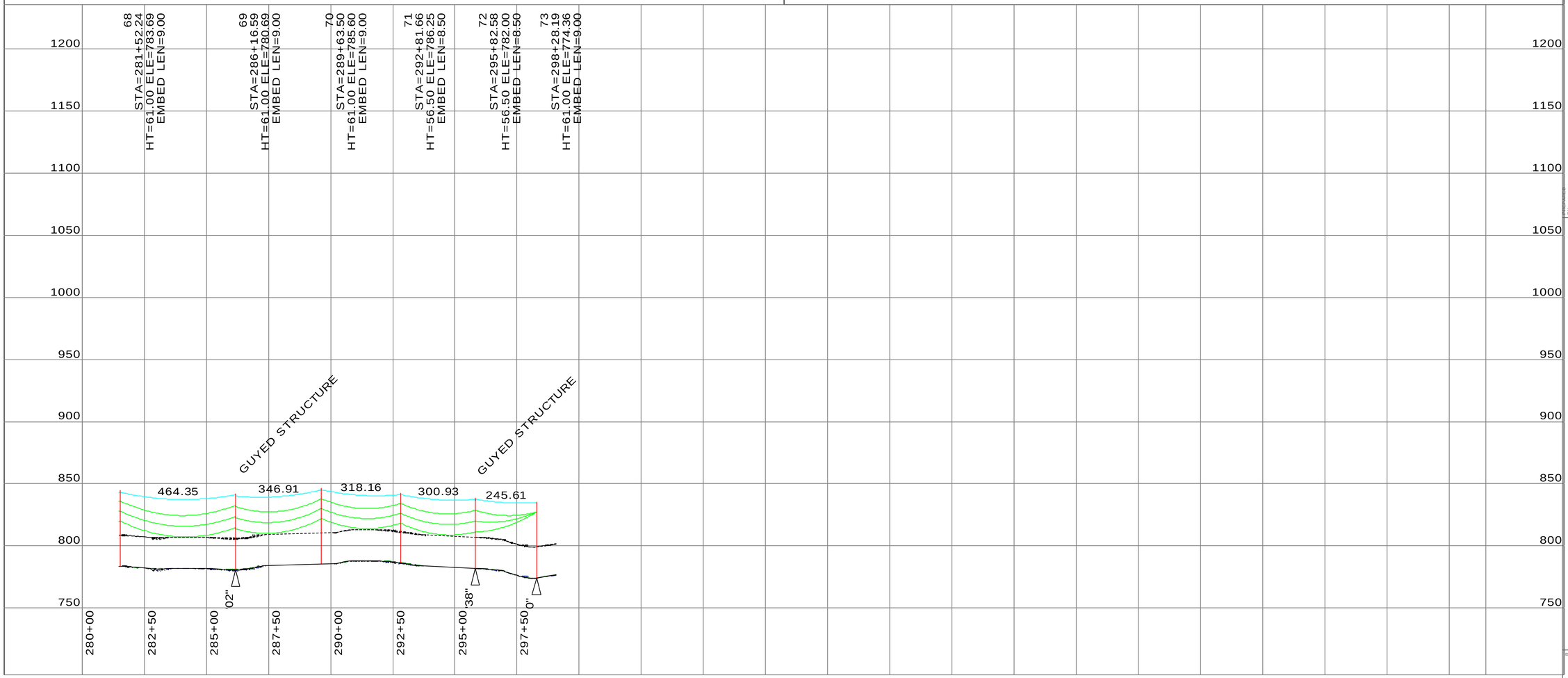
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE



INFORMATION SHOWN IS SUBJECT TO CHANGE. NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION	DRAWN	CHK	APPR
A	80416	RES 10% DESIGN	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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PROJECT NO.

WTG LAYOUT NO. XXXXXX

RES AMERICA CONSTRUCTION, INC.
11101 W 120TH AVE., SUITE 400 BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

BALL HILL - WIND ENERGY PROJECT

STA 280+00 TO STA 299+07
STR 68 TO STR 73

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

7 OF 7

D Material Safety Data Sheets

Product Name	Manufacturer Name
3M DP-810, 200 ml (3M(TM) Scotch-Weld(TM) Low Odor Acrylic Adhesive DP-810)	3M
3M™ Novec ™ 1230 Fire Protection Fluid	3M
Acetone	Borup Kemi I/S
Aerosol NC	Peter Kwasny Gmbh
ALEXIT WISCHFÜLLER 491-20 7808	Mankiewicz Gebr. & co.
ALEXIT-Decklack 402-40 RAL 5003 saphirblau	Mankiewicz Gebr. & Co.
Alexit-Zusatz / Hardener 495-20	Mankiewicz-Coatings LLC
Ampreg 21 Fast Hardener	GURIT (UK) LTD
Araldite 2010-1	Huntsman Advanced Materials
Araldite 2021B	Huntsman Advanced Materials
Araldite AV 4076-1	Huntsman Advanced Materials
Benzin Blyfri 95	YX Energy A/S (Texaco)
Brakleen Brake Parts Cleaner - Non-Chlorinated (Aerosol)	CRC Industries
CondorLube Wire & Chain Spray	Carl Stahl Câble SÂRL
Cutting fluid 11931	Ridge Tool Europe
D.E.R. 330 epoxy resin	DOW
Diesel - gasoline	YX Energy A/S (Texaco)
Diestone DLS - Satwipes / Prosat / Socowipes	Socomor
Dow Corning 7091 Adhesive Sealant Black	DOW
DOW CORNING(R) 7091 ADHESIVE SEALANT GRAY (silicone)	DOW
Dowcal 10 Heat Transfer Fluid	DOW
Econostitch	Airtech International. Inc.
EFASPRAY 0790	Esbjerg Farve & Lakfabrik A/S
Epilox A 18-00	LEUNA-HARZE GmbH
Epilox Harder M1093	Leuna Harze
Epilox M996	Leuna-Harze
Fibre Glass, Continuous Filament	PPG Industries Inc.
Flugrostentferner RL Nr. 23 (Rust film remover)	Tegee-Chemie Bremen GmbH
Hardener HV 5309-1	Huntsman Advanced Materials
Harpix cloths (resin)	Orapi Applied Limited
Hempadur Uniq 4774N	Hempel
Hempathane HS 5561P	Hempel
Hempel's Zinc Primer 16490	Hempel Coatings USA Inc.
HexPly M9.1 Prepreg	Hexcel Composites GmbH & Co.KG
HexPly M9.6, M9.6LT Prepeg	Hexcel Composites GmbH & Co.KG
Husholdningssprit 93%	Borup Kemi I/S
Intercryl 525	International Paint
Intercryl 700	International Paint
Interplus 356 Part A	International Paint
Interplus 356 Part B	International Paint
Interthane 990 Light Grey part A	International Paint
Interzone 954 part A	International Paint
Interzone 954 Part B	International Paint
IPA 70/30 - Satwipes / Prosat / Socosat	Socomor
Isopropanol 10%	Idekemi ApS
Kalk- & Rustfjerner (Calcium magnesium oxide (French chalk))	Borup Kemi I/S
KD-Check SD-1; Aerosol; Art. Nr. 9903.1	Altest NDT Udstyr ApS
Kema EL-K80 Kontaktrens Spray	ITW
Kema ELS-33 El-isol	ITW
Kema FS-35A Freeze Spray	ITW
Kema FW-1661 Leak Detector Spray	ITW
Kema GM-12 Sliding Agent Spray	ITW
Kema RAL-farver	ITW
Kema ZN-595 Zinc spray	ITW Chemical Products Scandinavia
Klüberplex AG 11-462	Klüber Lubrication
Klüberplex BEM 41-141	Klüber Lubrication
Klübersynth GEM 4-220N	Klüber Lubrication
Loctite 243	Henkel
Loctite 270	Henkel
Loctite 272	Henkel
Loctite 401	Henkel
Loctite 577	Henkel
Loctite 638	Henkel
Loctite 641	Henkel
Loctite 7063	Henkel
Loctite 7240	Henkel

Product Name	Manufacturer Name
Mobil Aero HF	Exxon Mobil
Mobil Glygoyle 11	Exxon Mobil
Mobil Glygoyle 30	Exxon Mobil
Mobil Glygoyle HE 320	Exxon Mobil
MOBIL SHC 630	Exxon Mobil
MOBILGEAR SHC 220	Exxon Mobil
MOBILITH SHC 220	Exxon Mobil
Multiaxial fabrics constructed from e-glass fibre for composite products.	Devold AMT AS
NEV-SZ REG NS160	BOSTIK
Oldopal Klebeharz 0588	BUFA Reaktionsharze GmbH&Co. KG
Optimat Carbon Veil	PRF Composite Materials
Optimol Optipit	Castrol
Optirens	North Clean Technology APS
Oxsilan MM-0705	Chemetall GmbH
Panex Carbon Fiber	Zoltek Companies, Inc.
Polyspeed Laminates	Hexcel Composites GmbH & Co.KG
Pyrostop 6, SF6	Inventec SA
RANDO HDZ LT 32	TEXACO
Rensebenzin	Borup Kemi I/S
ROCOL RTD LIQUID SKÆREOLIE	ITW
RTD Compound	Rocol Limited
Shell Tellus S4 VX 32	Shell
Shell Tivela Oil S 320	Shell
Shell Transaxle Oil 75W-90	Shell
SikaForce-7010	Sika
SikaForce-7020 (B)	Sika
SikaForce-7311 L45 GR Part A	Sika
SikaForce-7321 L30	Sika
SikaForce-7720 L105 Part A	Sika
SikaForce-7812 L7 MR	Sika
Sikaforce-7815	Sika
Sikasil Gasket	Sika
SP 4910 Resin RAL7035	GURIT (UK) LTD
SP 8565 Hardener	GURIT (UK) LTD
SP 9435	GURIT (UK) LTD
Spabond 730 Hardener	GURIT (UK) LTD
Spabond 730 Resin	GURIT (UK) LTD
Synlube CLP 320	YX Energy A/S (Texaco)
Texaco Pinnacle WM 320	Chevron
Tribol 1510/150	Deutsche BP AG, Geschäftsbereich Schmierstoffe
Tribol 1510/460	Castrol
Tribol 1510/680	BP
Tribol 1710/320	BP
Tygavac WL3900R	Tygavac Advanced Materials Ltd
Ultimeg 2020 Base	A.E.V. Plc / Advanced Electrical Varnishes
Ultimeg 2020 Hardener	A.E.V. Plc / Advanced Electrical Varnishes
VIP PS Tape	Richmond Aircraft Products
WD-40 Aerosol	WD-40 Company
Wemaplast 405-V base	WEMA
Wemaplast Härter 405-VS	WEMA
White Oil Pharmaceutical 240	HYDRO TEXACO A/S

Material Safety Data Sheet

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PRODUCT NAME: 3M(TM) Scotch-Weld(TM) Low Odor Acrylic Adhesive DP-810
MANUFACTURER: 3M
DIVISION: Industrial Adhesives and Tapes

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 01/12/2004
Supercedes Date: 01/08/2003

Document Group: 08-6267-2

ID Number(s):
62-3298-1430-5, 62-3298-1435-4, 62-3298-3530-0, 62-3298-3830-4, 62-3298-6830-1

This product is a kit or a multipart product which consists of multiple, independently packaged components. An MSDS for each of these components is included. Please do not separate the component MSDSs from this cover page. The document numbers of the MSDSs for components of this product are:

08-6252-4, 08-6239-1

Revision Changes:
Copyright was modified.
Page Heading: Product name was modified.
Kit: Product name was modified.
Kit: Division name was modified.
Kit: ID number(s) was modified.

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Document Group:	08-6252-4	**Version Number:**	15.00
Issue Date:	03/24/16	**Supercedes Date:**	04/16/15

SECTION 1: Identification

1.1. Product identifier
3M™ Scotch-Weld™ Low Odor Acrylic Adhesive DP810 Tan and Low Odor Acrylic Adhesive 810 Tan, Part A

Product Identification Numbers
62-3398-8730-9

1.2. Recommended use and restrictions on use

Recommended use
Structural adhesive

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Industrial Adhesives and Tapes Division International Operations
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Serious Eye Damage/Irritation: Category 1.
Skin Corrosion/Irritation: Category 2.
Skin Sensitizer: Category 1.
Specific Target Organ Toxicity (repeated exposure): Category 1.

2.2. Label elements
Signal word
Danger

Symbols
Corrosion | Exclamation mark | Health Hazard |

Pictograms

Hazard Statements
Causes serious eye damage.
Causes skin irritation.
May cause an allergic skin reaction.

Causes damage to organs through prolonged or repeated exposure:
nervous system |
respiratory system |

Precautionary Statements

Prevention:
Do not breathe dust/fume/gas/mist/vapors/spray.
Wear protective gloves and eye/face protection.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.

Response:
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF ON SKIN: Wash with plenty of soap and water.
Immediately call a POISON CENTER or doctor/physician.
If skin irritation or rash occurs: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.
Get medical advice/attention if you feel unwell.

Disposal:
Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

2.3. Hazards not otherwise classified
None.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
PHENOXYETHYL METHACRYLATE	10595-06-9	10 - 40 Trade Secret *
2-HYDROXYETHYL METHACRYLATE	868-77-9	10 - 30 Trade Secret *
2-HYDROXYPROPYL METHACRYLATE	923-26-2	10 - 30 Trade Secret *
ACRYLATE OLIGOMER	41637-38-1	5 - 20 Trade Secret *
ACRYLONITRILE-BUTADIENE POLYMER	9010-81-5	5 - 20 Trade Secret *
CUMENE HYDROPEROXIDE	80-15-9	< 5 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. If you feel unwell, get medical attention.

Skin Contact:
Immediately wash with soap and water. Remove contaminated clothing and wash before reuse. If signs/symptoms develop, get medical attention.

Eye Contact:
Immediately flush with large amounts of water for at least 15 minutes. Remove contact lenses if easy to do. Continue rinsing. Immediately get medical attention.

If Swallowed:
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required
Not applicable

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.

5.2. Special hazards arising from the substance or mixture
Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Oxides of Nitrogen	During Combustion
Toxic Vapor, Gas, Particulate	During Combustion

5.3. Special protective actions for fire-fighters
No special protective actions for fire-fighters are anticipated.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up
Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent

material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
For industrial or professional use only. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wash contaminated clothing before reuse. Keep away from reactive metals (eg. Aluminum, zinc etc.) to avoid the formation of hydrogen gas that could create an explosion hazard.

7.2. Conditions for safe storage including any incompatibilities
Store away from heat. Store away from amines.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
CUMENE HYDROPEROXIDE	80-15-9	AIHA	TWA:6 mg/m3(1 ppm)	Skin Notation

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
OSHA : United States Department of Labor - Occupational Safety and Health Administration
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Full Face Shield
Indirect Vented Goggles

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.
Gloves made from the following material(s) are recommended: Butyl Rubber

Fluoroelastomer

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Liquid
Specific Physical Form:	Paste
Odor, Color, Grade:	white, low odor
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	*Not Applicable*
Boiling Point	>=217 ºF
Flash Point	216 ºF [*Test Method:* Closed Cup]
Evaporation rate	*No Data Available*
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	*No Data Available*
Flammable Limits(UEL)	*No Data Available*
Vapor Pressure	<=0.1 mmHg
Vapor Density	*Not Applicable*
Density	1.07 g/ml
Specific Gravity	1.07 [*Ref Std:* WATER=1]
Solubility in Water	Slight (less than 10%)
Solubility- non-water	*No Data Available*
Autoignition temperature	*No Data Available*
Decomposition temperature	*No Data Available*
Viscosity	20,000 centipoise
Hazardous Air Pollutants	< 40 % weight [*Test Method:* Calculated]
Molecular weight	*No Data Available*
VOC Less H2O & Exempt Solvents	3.1 g/l [*Details:* when used as intended with Part B]
VOC Less H2O & Exempt Solvents	0.3 % [*Details:* when used as intended with Part B]
VOC Less H2O & Exempt Solvents	349 g/l [*Test Method:* tested per EPA method 24] [*Details:* as supplied]

SECTION 10: Stability and reactivity

10.1. Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization may occur.

10.4. Conditions to avoid

Heat
Sparks and/or flames
Heat is generated during cure. Do not cure a mass larger than 50 grams in a confined space to prevent a premature exothermic reaction with production of intense heat and smoke.

10.5. Incompatible materials
Amines
Reducing agents
Reactive metals

10.6. Hazardous decomposition products

Substance	Condition
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
May be harmful if inhaled.
Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

May cause additional health effects (see below).

Skin Contact:
Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.
Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Eye Contact:
Corrosive (Eye Burns): Signs/symptoms may include cloudy appearance of the cornea, chemical burns, severe pain, tearing, ulcerations, significantly impaired vision or complete loss of vision.

Ingestion:
May be harmful if swallowed.
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May cause additional health effects (see below).

Additional Health Effects:

Prolonged or repeated exposure may cause target organ effects:

Neurological Effects: Signs/symptoms may include personality changes, lack of coordination, sensory loss, tingling or numbness of the extremities, weakness, tremors, and/or changes in blood pressure and heart rate.

Respiratory Effects: Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish colored skin (cyanosis), sputum production, changes in lung function tests, and/or respiratory failure.

Toxicological Data

If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE > 5,000 mg/kg
Overall product	Inhalation-Vapor(4 hr)		No data available; calculated ATE 20 - 50 mg/l
Overall product	Ingestion		No data available; calculated ATE 2,000 - 5,000 mg/kg
PHENOXYETHYL METHACRYLATE	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
2-HYDROXYETHYL METHACRYLATE	Dermal	Rabbit	LD50 > 5,000 mg/kg
2-HYDROXYETHYL METHACRYLATE	Ingestion	Rat	LD50 5,564 mg/kg
ACRYLONITRILE-BUTADIENE POLYMER	Dermal		LD50 estimated to be > 5,000 mg/kg
ACRYLONITRILE-BUTADIENE POLYMER	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
2-HYDROXYPROPYL METHACRYLATE	Ingestion	Rat	LD50 > 2,000 mg/kg
ACRYLATE OLIGOMER	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
ACRYLATE OLIGOMER	Ingestion	Rat	LD50 > 2,000 mg/kg
CUMENE HYDROPEROXIDE	Dermal	Rat	LD50 500 mg/kg
CUMENE HYDROPEROXIDE	Inhalation-Vapor (4 hours)	Rat	LC50 1.4 mg/l
CUMENE HYDROPEROXIDE	Ingestion	Rat	LD50 382 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
PHENOXYETHYL METHACRYLATE	similar compounds	Irritant
2-HYDROXYETHYL METHACRYLATE	Rabbit	Minimal irritation
ACRYLONITRILE-BUTADIENE POLYMER	Professional judgement	No significant irritation
CUMENE HYDROPEROXIDE	Rabbit	Corrosive

Serious Eye Damage/Irritation

Name	Species	Value
PHENOXYETHYL METHACRYLATE	similar compounds	Severe irritant
2-HYDROXYETHYL METHACRYLATE	Rabbit	Moderate irritant
ACRYLONITRILE-BUTADIENE POLYMER	Professional judgement	No significant irritation
CUMENE HYDROPEROXIDE	Rabbit	Corrosive

Skin Sensitization

Name	Species	Value
2-HYDROXYETHYL METHACRYLATE	Human and animal	Sensitizing
ACRYLATE OLIGOMER	Guinea pig	Not sensitizing

Respiratory Sensitization
For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
PHENOXYETHYL METHACRYLATE	In Vitro	Not mutagenic
2-HYDROXYETHYL METHACRYLATE	In vivo	Not mutagenic
2-HYDROXYETHYL METHACRYLATE	In Vitro	Some positive data exist, but the data are not sufficient for classification
ACRYLATE OLIGOMER	In Vitro	Not mutagenic
CUMENE HYDROPEROXIDE	In vivo	Not mutagenic
CUMENE HYDROPEROXIDE	In Vitro	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity
For the component/components, either no data are currently available or the data are not sufficient for classification.

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
2-HYDROXYETHYL METHACRYLATE	Ingestion	Not toxic to female reproduction	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
2-HYDROXYETHYL METHACRYLATE	Ingestion	Not toxic to male reproduction	Rat	NOAEL 1,000 mg/kg/day	49 days
2-HYDROXYETHYL METHACRYLATE	Ingestion	Not toxic to development	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
CUMENE HYDROPEROXIDE	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	occupational exposure
CUMENE HYDROPEROXIDE	Inhalation	respiratory irritation	May cause respiratory irritation	Human	NOAEL Not available	occupational exposure
CUMENE HYDROPEROXIDE	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Professional judgement	NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
CUMENE HYDROPEROXIDE	Inhalation	nervous system | respiratory system	Causes damage to organs through prolonged or repeated exposure	Rat	LOAEL 0.2 mg/l	7 days
CUMENE HYDROPEROXIDE	Inhalation	heart | liver | kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 0.03 mg/l	90 days

Aspiration Hazard

For the component/components, either no data are currently available or the data are not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods
Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of completely cured (or polymerized) material in a permitted industrial waste facility. As a disposal alternative, incinerate uncured product in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations
Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - Yes

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
PHENOXYETHYL METHACRYLATE (GLYCOL ETHERS)	10595-06-9	10 - 40
CUMENE HYDROPEROXIDE	80-15-9	Trade Secret < 5

15.2. State Regulations
Contact 3M for more information.

15.3. Chemical Inventories
The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

15.4. International Regulations
Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification
Health: 3 **Flammability:** 1 **Instability:** 1 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Document Group:	08-6252-4	**Version Number:**	15.00
Issue Date:	03/24/16	**Supercedes Date:**	04/16/15

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Safety Data Sheet

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Document Group:	08-6239-1	**Version Number:**	19.00
Issue Date:	03/24/16	**Supercedes Date:**	05/21/15

SECTION 1: Identification

1.1. Product identifier
3M™ Scotch-Weld™ Low Odor Acrylic Adhesive DP810 Tan and Low Odor Acrylic Adhesive 810 Tan, Part B

Product Identification Numbers
62-3298-8730-1

1.2. Recommended use and restrictions on use

Recommended use
Structural adhesive

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Industrial Adhesives and Tapes Division International Operations
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Serious Eye Damage/Irritation: Category 2A.
Skin Corrosion/Irritation: Category 2.
Skin Sensitizer: Category 1.

2.2. Label elements
Signal word
Warning

Symbols
Exclamation mark |

Pictograms

Hazard Statements
Causes serious eye irritation.
Causes skin irritation.
May cause an allergic skin reaction.

Precautionary Statements

Prevention:
Avoid breathing dust/fume/gas/mist/vapors/spray.
Wear protective gloves and eye/face protection.
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.

Response:
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF ON SKIN: Wash with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.

Disposal:
Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

2.3. Hazards not otherwise classified
None.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
PHENOXYETHYL METHACRYLATE	10595-06-9	10 - 40 Trade Secret *
2-HYDROXYETHYL METHACRYLATE	868-77-9	10 - 30 Trade Secret *
2-HYDROXYPROPYL METHACRYLATE	923-26-2	10 - 30 Trade Secret *
ACRYLATE OLIGOMER	41637-38-1	5 - 20 Trade Secret *
ACRYLONITRILE-BUTADIENE POLYMER	9010-81-5	5 - 20 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. If you feel unwell, get medical attention.

Skin Contact:
Immediately wash with soap and water. Remove contaminated clothing and wash before reuse. If signs/symptoms develop,

get medical attention.

Eye Contact:
Immediately flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. Get medical attention.

If Swallowed:
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required
Not applicable

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.

5.2. Special hazards arising from the substance or mixture
Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Oxides of Nitrogen	During Combustion
Toxic Vapor, Gas, Particulate	During Combustion

5.3. Special protective actions for fire-fighters
No special protective actions for fire-fighters are anticipated.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment.

6.3. Methods and material for containment and cleaning up
Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

For industrial or professional use only. Avoid breathing dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Keep away from reactive metals (eg. Aluminum, zinc etc.) to avoid the formation of hydrogen gas that could create an explosion hazard.

7.2. Conditions for safe storage including any incompatibilities
Store away from heat. Store away from amines.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
No occupational exposure limit values exist for any of the components listed in Section 3 of this SDS.

8.2. Exposure controls

8.2.1. Engineering controls
No engineering controls required.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Indirect Vented Goggles

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.
Gloves made from the following material(s) are recommended: Butyl Rubber
Fluoroelastomer
Neoprene

Respiratory protection
None required.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Liquid
Specific Physical Form:	Paste
Odor, Color, Grade:	slight fragrance, green
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	*Not Applicable*
Boiling Point	> 93 ºC
Flash Point	> 200 ºF [*Test Method:* Closed Cup]
Evaporation rate	*No Data Available*
Flammability (solid, gas)	Not Applicable

Flammable Limits(LEL)	*No Data Available*
Flammable Limits(UEL)	*No Data Available*
Vapor Pressure	<=0.1 mmHg
Vapor Density	*No Data Available*
Density	1.07 g/ml
Specific Gravity	1.07 [*Ref Std:* WATER=1]
Solubility in Water	Slight (less than 10%)
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*No Data Available*
Decomposition temperature	*No Data Available*
Viscosity	20,000 centipoise
Hazardous Air Pollutants	< 40 % weight [*Test Method:* Calculated]
Molecular weight	*No Data Available*
VOC Less H2O & Exempt Solvents	3.1 g/l [*Details:* when used as intended with Part A]
VOC Less H2O & Exempt Solvents	0.3 % [*Details:* when used as intended with Part A]
VOC Less H2O & Exempt Solvents	319 g/l [*Test Method:* tested per EPA method 24] [*Details:* as supplied]

SECTION 10: Stability and reactivity

10.1. Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization may occur.

10.4. Conditions to avoid
Heat
Sparks and/or flames
Heat is generated during cure. Do not cure a mass larger than 50 grams in a confined space to prevent a premature exothermic reaction with production of intense heat and smoke.

10.5. Incompatible materials
Amines
Reducing agents
Reactive metals

10.6. Hazardous decomposition products

Substance	**Condition**
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be

relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
No health effects are expected.

Skin Contact:
Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.
Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Eye Contact:
Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Ingestion:
May be harmful if swallowed.
Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Ingestion		No data available; calculated ATE 2,000 - 5,000 mg/kg
PHENOXYETHYL METHACRYLATE	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
2-HYDROXYETHYL METHACRYLATE	Dermal	Rabbit	LD50 > 5,000 mg/kg
2-HYDROXYETHYL METHACRYLATE	Ingestion	Rat	LD50 5,564 mg/kg
ACRYLONITRILE-BUTADIENE POLYMER	Dermal		LD50 estimated to be > 5,000 mg/kg
ACRYLONITRILE-BUTADIENE POLYMER	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
2-HYDROXYPROPYL METHACRYLATE	Ingestion	Rat	LD50 > 2,000 mg/kg
ACRYLATE OLIGOMER	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
ACRYLATE OLIGOMER	Ingestion	Rat	LD50 > 2,000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
PHENOXYETHYL METHACRYLATE	similar compounds	Irritant
2-HYDROXYETHYL METHACRYLATE	Rabbit	Minimal irritation
ACRYLONITRILE-BUTADIENE POLYMER	Professional judgement	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value

PHENOXYETHYL METHACRYLATE	similar compounds	Severe irritant
2-HYDROXYETHYL METHACRYLATE	Rabbit	Moderate irritant
ACRYLONITRILE-BUTADIENE POLYMER	Professional judgement	No significant irritation

Skin Sensitization

Name	Species	Value
2-HYDROXYETHYL METHACRYLATE	Human and animal	Sensitizing
ACRYLATE OLIGOMER	Guinea pig	Not sensitizing

Respiratory Sensitization

For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
PHENOXYETHYL METHACRYLATE	In Vitro	Not mutagenic
2-HYDROXYETHYL METHACRYLATE	In vivo	Not mutagenic
2-HYDROXYETHYL METHACRYLATE	In Vitro	Some positive data exist, but the data are not sufficient for classification
ACRYLATE OLIGOMER	In Vitro	Not mutagenic

Carcinogenicity

For the component/components, either no data are currently available or the data are not sufficient for classification.

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
2-HYDROXYETHYL METHACRYLATE	Ingestion	Not toxic to female reproduction	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
2-HYDROXYETHYL METHACRYLATE	Ingestion	Not toxic to male reproduction	Rat	NOAEL 1,000 mg/kg/day	49 days
2-HYDROXYETHYL METHACRYLATE	Ingestion	Not toxic to development	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

For the component/components, either no data are currently available or the data are not sufficient for classification.

Specific Target Organ Toxicity - repeated exposure

For the component/components, either no data are currently available or the data are not sufficient for classification.

Aspiration Hazard

For the component/components, either no data are currently available or the data are not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods
Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of completely cured (or polymerized) material in a permitted industrial waste facility. As a disposal alternative, incinerate uncured product in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations
Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - No

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
PHENOXYETHYL METHACRYLATE (GLYCOL ETHERS)	10595-06-9	10 - 40

15.2. State Regulations
Contact 3M for more information.

15.3. Chemical Inventories
The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

15.4. International Regulations

Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification
Health: 2 **Flammability:** 1 **Instability:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Document Group:	08-6239-1	**Version Number:**	19.00
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Document Group:	16-3425-2	**Version Number:**	28.02
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SECTION 1: Identification

1.1. Product identifier
3M™ Novec ™ 1230 Fire Protection Fluid [FK-5-1-12]

Product Identification Numbers
98-0212-3203-2, 98-0212-3217-2, 98-0212-3414-5

1.2. Recommended use and restrictions on use

Recommended use
Streaming and Flooding Fire Protection

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Electronics Materials Solutions Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Not classified as hazardous according to OSHA Hazard Communication Standard, 29 CFR 1910.1200.

2.2. Label elements
Signal word
Not applicable.

Symbols
Not applicable.

Pictograms
Not applicable.

2.3. Hazards not otherwise classified
None.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	756-13-8	> 99.5

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. If you are concerned, get medical advice.

Skin Contact:
Wash with soap and water. If signs/symptoms develop, get medical attention.

Eye Contact:
Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, get medical attention.

If Swallowed:
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required
Not applicable

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
Product is a fire-extinguishing agent. Material will not burn. Use a fire fighting agent suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture
Exposure to extreme heat can give rise to thermal decomposition.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Toxic Vapor/Gas	During Combustion

5.3. Special protective actions for fire-fighters
When fire fighting conditions are severe and total thermal decomposition of the product is possible, wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation

to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up
Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Seal the container. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Contents may be under pressure, open carefully. Do not breathe thermal decomposition products. For industrial or professional use only. Do not use in a confined area with minimal air exchange. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment.

7.2. Conditions for safe storage including any incompatibilities
Protect from sunlight. Store in a well-ventilated place. Store at temperatures not exceeding 38C/100F Store away from strong bases. Store away from other materials. Store away from amines.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	756-13-8	Manufacturer determined	TWA:150 ppm(1940 mg/m3)	

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
OSHA : United States Department of Labor - Occupational Safety and Health Administration
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
Provide appropriate local exhaust when product is heated. For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use with appropriate local exhaust ventilation sufficient to maintain levels of thermal decomposition products below their exposure guidelines. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Eye protection not required.

Skin/hand protection
No protective gloves required.

Respiratory protection

Use a positive pressure supplied-air respirator if there is a potential for over exposure from an uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection. If thermal degradation products are expected, use a full facepiece supplied-air respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Liquid
Specific Physical Form:	Liquid
Odor, Color, Grade:	Clear colorless liquid with low odor
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	-108 ºC
Boiling Point	49 ºC [@ 760 mmHg]
Flash Point	No flash point
Evaporation rate	> 1 [*Ref Std:* BUOAC=1]
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	None detected
Flammable Limits(UEL)	None detected
Vapor Pressure	40.4 kPa [@ 25 ºC]
Vapor Density	11.6 [*Ref Std:* AIR=1]
Specific Gravity	1.6 [@ 68 ºF] [*Ref Std:* WATER=1]
Solubility in Water	Nil
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*Not Applicable*
Decomposition temperature	*No Data Available*
Viscosity	0.6 centipoise [@ 25 ºC]
Volatile Organic Compounds	1600 g/l [*Test Method:* calculated SCAQMD rule 443.1]
Percent volatile	100 %
VOC Less H2O & Exempt Solvents	1600 g/l [*Test Method:* calculated SCAQMD rule 443.1]

SECTION 10: Stability and reactivity

10.1. Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4. Conditions to avoid
Light

10.5. Incompatible materials
Strong bases
Amines
Alcohols

10.6. Hazardous decomposition products

Substance	Condition
Hydrogen Fluoride	At Elevated Temperatures - extreme conditions of heat

Refer to section 5.2 for hazardous decomposition products during combustion.

If the product is exposed to extreme condition of heat from misuse or equipment failure, toxic decomposition products that include hydrogen fluoride and perfluoroisobutylene can occur. Extreme heat arising from situations such as misuse or equipment failure can generate hydrogen fluoride as a decomposition product.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
No known health effects.

Skin Contact:
Contact with the skin during product use is not expected to result in significant irritation.

Eye Contact:
Contact with the eyes during product use is not expected to result in significant irritation.

Ingestion:
May be harmful if swallowed.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Dermal	Rat	LD50 > 2,000 mg/kg
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation-Vapor (4 hours)	Rat	LC50 > 1,227 mg/l
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Ingestion	Rat	LD50 > 2,000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Rabbit	No significant irritation

Skin Sensitization

Name	Species	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Guinea pig	Not sensitizing

Respiratory Sensitization

For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	In Vitro	Not mutagenic
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	In vivo	Not mutagenic

Carcinogenicity

For the component/components, either no data are currently available or the data are not sufficient for classification.

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation	Not toxic to female reproduction	Rat	NOAEL 3,000 ppm	premating & during gestation
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation	Not toxic to male reproduction	Rat	NOAEL 3,000 ppm	premating & during gestation
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation	Not toxic to development	Rat	NOAEL 3,000 ppm	premating & during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation	nervous system	All data are negative	Rat	NOAEL 100,000 ppm	2 hours
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation	cardiac sensitization	All data are negative	Dog	Sensitization Negative	17 minutes

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
1,1,1,2,2,4,5,5,5-Nonafluoro-4-	Inhalation	liver | kidney and/or bladder	Some positive data exist, but the data are not sufficient for	Rat	NOAEL 3,000 ppm	90 days

(trifluoromethyl)-3-pentanone			classification			
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation	heart | endocrine system | hematopoietic system | muscles | nervous system | respiratory system | vascular system	All data are negative	Rat	NOAEL 3,000 ppm	90 days

Aspiration Hazard
For the component/components, either no data are currently available or the data are not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Test Organism	Test Type	Result
Green algae, Selenastrum capricornutum	72 hours Effect Concentration 50%	7.7 mg/l
Zebra Fish, Brachydanio rerio	96 hours Lethal Concentration 50%	>1200 mg/l
Water flea, Daphnia magna	48 hours Effect Concentration 50%	>1200 mg/l
Green algae, Selenastrum capricornutum	72 hours No obs Effect Conc	1.2 mg/l

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods
Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include HF. Facility must be capable of handling halogenated materials.
Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - No Delayed Hazard - No

15.2. State Regulations

Contact 3M for more information.

15.3. Chemical Inventories

The components of this product are in compliance with the new substance notification requirements of CEPA.

The components of this material are in compliance with the China "Measures on Environmental Management of New Chemical Substance". Certain restrictions may apply. Contact the selling division for additional information.

The components of this material are in compliance with the provisions of the Korean Toxic Chemical Control Law. Certain restrictions may apply. Contact the selling division for additional information.

The components of this material are in compliance with the provisions of Japan Chemical Substance Control Law. Certain restrictions may apply. Contact the selling division for additional information.

The components of this material are in compliance with the provisions of Philippines RA 6969 requirements. Certain restrictions may apply. Contact the selling division for additional information.

The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

15.4. International Regulations

Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification
Health: 3 **Flammability:** 0 **Instability:** 1 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification
Health: 1 **Flammability:** 0 **Physical Hazard:** 1 **Personal Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS® IV) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® IV ratings are to be used with a fully implemented HMIS® IV program. HMIS® is a registered mark of the American Coatings Association (ACA).

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SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING			
Trade name:	Acetone	PR-No.:	
Usage:	The product is used as a solvent and cleaning agent.		
Date:	10-01-2011	SDS Version:	1.1
Contact:	Julius Novark	E-mail:	jn@borup-kemi.dk
Company and address:	Borup Kemi I/S Bækgårdsvej 53 4140 Borup Tlf: 5756 0020 Fax: 5756 0021 www.borup-kemi.dk	Emergency telephone: Use your national or local emergency number See section 4 “First aid measures”	

2. HAZARD IDENTIFICATION						
Danger symbol:						
Signal word:	**Danger!**					
Classification:	**Eye Irrit. 2, STOT SE 3, Flam. Liq. 2**					
Risk etc.:	Highly flammable liquid and vapour. Causes serious eye irritation. May cause drowsiness or dizziness.					
Contains:	acetone. Index-no.: 606-001-00-8					
P-phrases (precautionary statements):	General:	Keep out of reach of children. If medical advice is needed, have product container or label at hand.				
	Prevention:	Keep away from heat/sparks/open flames/hot surfaces. — No smoking.				
	Response:	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.				
	Storage:	Store in a well-ventilated place.				
	Disposal:	-				
Additional warnings:	This product contains an organic solvent. Repeated exposure to organic solvents can result in damage to the nervous system and inner organs, such as the liver and kidneys.					
Additional labelling:	Repeated exposure may cause skin dryness or cracking.					
Further:	Tactile warning.					
VOC	VOC_{max}:	NA	VOC_{limit}:	-	Category:	-
▼DPD/DSD Classification:	Irritating to eyes.(R36). Flammable.(R10). Repeated exposure may cause skin dryness or cracking. (R66). Vapours may cause drowsiness and dizziness.(R67).					

3. COMPOSITION/INFORMATION ON INGREDIENTS

NAME:	acetone
IDENTIFICATION NOS.:	CAS-no: 67-64-1 EC-no: 200-662-2 Index-no: 606-001-00-8
CONTENT:	95-100%
DSD CLASSIFICATION:	F; R11 Xi; R36 R66 R67
CLP CLASSIFICATION:	Flam. Liq. 2, STOT SE 3, Eye Irrit. 2 H225, H319, H336, EUH066
NOTE:	S

(*) See full text of H-phrases in chapter 16. Occupational limits are listed in section 8, if these are available.
(**)Explanation:S = Organic solvent

4. FIRST AID MEASURES

General information:	Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar. In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. The doctor can contact the Work Environment Medical Clinic at Bispebjerg Hospital, tlf. 35 31 60 60
After inhalation:	Get the injured person into fresh air. Make sure there is always someone with the injured person. Prevent shock by keeping the injured person warm and calm. If the person stops breathing, give mouth-to-mouth resuscitation. If unconscious, roll the injured person onto side with the top leg bent at both knee and hip. Call an ambulance.
After skin contact:	Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.
After eye contact:	Remove contact lenses. Flush eyes with plenty of water (20-30°C) for at least 15 minutes and continue until irritation stops. Make sure you flush under the upper and lower eyelids. Contact a doctor at once.
After swallowing:	Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.
Burning:	Pour water until the pain stops and continue for 30 minutes.
Information to medics:	Bring this safety data sheet.

5. Fire-fighting measures

Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses.

Suitable extinguishing measures:	Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.
Fire degradation products:	Carbon oxides.
Special protective equipment for fire fighting:	Wear self-contained breathing apparatus and protective clothing to prevent contact.

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6. ACCIDENTAL RELEASE MEASURES	
Personal precautions:	Avoid inhalation of vapours from waste material. Stores that have not ignited must be cooled by water mist. Where possible, remove flammable materials. Make sure there is sufficient ventilation. See section on “Exposure checks/personal protective gear” for protective measures.
Environmental precautions:	Consider putting up waste collecting trays/basins to prevent leakage to the surroundings. Limit spillage and collect using granulate or similar, and dispose of it in accordance with the regulations on dangerous waste. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided. See section on “Disposal” with regard to the handling of waste.
Methods for cleaning up/taking up:	Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations.

7. HANDLING AND STORAGE	
Handling:	See section on “Exposure checks/personal protective gear” for information on personal protection.
Storage temperature:	Cool and frostfree
Storage:	Must be kept in a dry, cool and ventilated place. Always store in containers of the same material as the original. Must be stored in a cool and ventilated area, away from possible sources of combustion.
Advice on protection against fire and explosion:	-

8. EXPOSURE CONTROLS/PERSONAL PROCECTION								
General recommendations:	Smoking, consumption of food or liquid, and storage of tobacco, food or liquid, are not allowed in the workroom.							
Exposure scenarios:	If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.							
Exposure limits:	Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.							
Exposure controls:	Compliance with the stated exposure limits values should be checked on a regular basis. See Danish Working Environment Authority guideline, D.7.1. May 2001.							
Engineering measures:	Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see below). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.							
Hygiene measures:	Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.							
Exposure limits values:	Name	STEL (ppm)	STEL (mg/m3)	TWA (mg/m3)	TWA (ppm)	Note#	Year	Source
PNEC / DNEL	DNEL (acetone): 186 mg/kg bw/d - Exposure: Dermal - Duration: Long term DNEL (acetone): 2420 mg/m3 - Exposure: Inhalation - Duration: Short term DNEL (acetone): 1210 mg/m3 - Exposure: Inhalation - Duration: Long term DNEL (acetone): 62 mg/kg bw/d - Exposure: Oral - Duration: Long term PNEC (acetone): 10,6 mg/L - Exposure: Water - Duration: Single							
#) Explanation(s):	NA							
Adequate personal protective equipment:								

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Generally:	Insofar as the work process is covered by the Executive Order on work with coded products (Danish Working Environment Authority's Executive Order No. 302/1993), protection gear must be chosen in accordance with this. See the product's code in the section on "information on regulation".
Respiratory Equipment:	Recommended: Unassisted fresh air hose breathing apparatus, -,
Skin protection:	Special work clothing should be used.
Hand protection:	Recommended: Butylgummi. Breakthrough time: See the manufacturer's instructions
Eye protection:	Use face shield. Use safety glasses with a side shield as an alternative.
Measures to avoid environmental exposure:	Keep damming materials near the workplace. If possible collect spillage during work.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	Colour:	Odour:	pH:	Density, g/cm^3:
Liquid	Colourless	Characteristic		0,79

Viscosity:

Phase changes

Melting point °C:	Boiling point °C:	Vapour pressure:
-95,3	52,2	-

Data on fire and explosion hazards

Flashpoint °C:	Ignition °C:	Self ignition °C:
-18		-

Explosive properties	Oxidizing properties
-	-

Solubility

Soluble in water	Solubility in fat	n-octanol/water coefficient
Insoluble	-	-

10. STABILITY AND REACTIVITY

Stability:	The product is stable under the conditions, noted in the section on "Handling and storage".
Conditions and materials to avoid	Strong acids, strong bases, strong oxidising agents, and strong catabolic agents.
Hazardous decomposition products	If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:

Substance	Art	Test	Route	Result
acetone	Rat	LC50	Inhalation	50100 mg/m3/8h

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	acetone acetone	Rabbit Rat	LD lo LD50	Dermal Oral	20 mL/kg 5800 mg/kg
Long term causes:	Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens. Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin's natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.				

12. ECOLOGICAL INFORMATION

Persistence:	Substance	Biodegradable	Test	Result
	acetone	Yes	No data available	No data available

Bioaccumulations:	Substance	Potential bioaccumulation	Test	
			LogPow	BCF
	acetone	No	-0,24	No data available

Ecotoxic effects:	Substance	Art	Test	Period	Result
	acetone acetone acetone	Fish Daphnia Algae	LC50 EC50 EC50	96 h 48 h 48 h	13000000 ug/L 23500000 ug/L 5600000-10000000 ug/L

Negative effects:	-
Mobility in soil:	No data available
Results of PBT and vPvB assessment:	No data available

13. DISPOSAL CONSIDERATIONS

The product is covered by the regulations on dangerous waste.

Waste:	EWC-code		
	20 01 13		
Other labelling:	-		
Contaminated packing:	Packaging which contains leftovers from the product must be disposed of in the same way as the product.		

14. TRANSPORT INFORMATION

This product is covered by the conventions on dangerous goods.

ADR/RID	UN-nr.	Proper Shipping Name	Class	PG*	Notes

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	1090	ACETONE	3	II			
IMDG	UN-no.	Proper Shipping Name	Class	PG*	EmS	MP	Hazardous constituent
	1090	Acetone	3	II	F-E, S-D		
* Packing group							

2033010169, Borup Kemi I/S15. REGULATORY INFORMATION	
Restrictions for application:	People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC. For exceptions, see the Danish Working Environment Authority's Executive Order No. 239 of 6 April 2005.
Demands for specific education:	No specific requirements.
Chemical safety assessment:	No

16. OTHER INFORMATION

Sources:	EC regulation 1907/2006 (REACH) Directive 2000/532/EC EC Regulation 1272/2008 (CLP)
Full text of R-phrases as mentioned in section 3:	EUH066 - Repeated exposure may cause skin dryness or cracking. H336 - May cause drowsiness or dizziness. H319 - Causes serious eye irritation. H225 - Highly flammable liquid and vapour.

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.

The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.

A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

This safety data sheet is based on available information/data at the time of the preparation.

Safety data sheet is validated by:	TS
Date of last essential change (First cipher in SDS version)	05-01-2011 15:04:00
Date of last minor change (Last cipher in SDS version)	05-01-2011 15:04:00

SAFETY DATA SHEET

1. Identification

Product identifier	**Belton RAL Aerosoles**
Other means of identification	None.
Recommended use	On Metal objects.
Recommended restrictions	None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer	HC Farver A/S
Address	Lucernevej 75, 8920 Randers NV
Country	Denmark
Telephone number	0045 - 86438500
Contact person	Rune Hauge
E-mail	RH hcfarver.dk
Emergency telephone number	0045-86438500

2. Hazard(s) identification

Physical hazards	Flammable aerosols	Category 1
Health hazards	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2
	Carcinogenicity	Category 2
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Specific target organ toxicity, repeated exposure	Category 2 (Central nervous system, Liver, Kidney)

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement Extremely flammable aerosol. Pressurized container: May burst if heated. Causes skin irritation. Causes serious eye irritation. Suspected of causing cancer. May cause drowsiness or dizziness. May cause damage to organs (Central nervous system, Liver, Kidney) through prolonged or repeated exposure.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not spray on an open flame or other ignition source. Pressurized container: Do not pierce or burn, even after use. Wear protective gloves/protective clothing/eye protection/face protection. Do not breathe mist or vapor. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling.

Response If exposed or concerned: Get medical advice/attention. If on skin: Wash with plenty of water/. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor// if you feel unwell. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Storage Store in a well-ventilated place. Keep container tightly closed. Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	None.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Acetone	67-64-1	25-50
Butane	106-97-8	10-25
Nitrocellulose	9004-70-0	5-10
Propane	74-98-6	5-10
ylene	1330-20-7	5-10
n-Butyl acetate	123-86-4	5-10
2-Methoxy-1-methylethyl acetate	108-65-6	2.5-5.0
Ethanol	64-17-5	2.5-5.0
Methyl isobutyl ketone	108-10-1	2.5-5.0

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.

Skin contact Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. If eye irritation persists: Get medical advice/attention.

Ingestion In the unlikely event of swallowing contact a physician or poison control center.

Most important symptoms/effects, acute and delayed May cause drowsiness and dizziness. Headache. Severe eye irritation. Skin irritation. May cause redness and pain. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed Treat symptomatically. Symptoms may be delayed.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical Contents under pressure. Pressurized container may explode when exposed to heat or flame. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Move containers from fire area if you can do so without risk. Containers should be cooled with water to prevent vapor pressure build up.

General fire hazards Extremely flammable aerosol.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Do not breathe vapors, aerosols. Wear appropriate protective equipment and clothing during clean-up. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Stop leak if you can do so without risk. Move the cylinder to a safe and open area if the leak is irreparable. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material.

Large Spills: Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Absorb in vermiculite, dry sand or earth and place into containers. Scoop up used absorbent into drums or other appropriate container. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.

Environmental precautions

Aerosol containers should not be dumped in nature. Aerosol containers should be disposed of in accordance with applicable federal, state, and local regulations.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Pressurized container: Do not pierce or burn, even after use. Do not use if spray button is missing or defective. Do not spray on a naked flame or any other incandescent material. Do not smoke while using or until sprayed surface is thoroughly dry. Do not cut, weld, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition. Do not re-use empty containers. Do not breathe vapors, aerosols. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Should be handled in closed systems, if possible. Use only in well-ventilated areas. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store locked up. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C/122 °F. Do not puncture, incinerate or crush. Do not handle or store near an open flame, heat or other sources of ignition. This material can accumulate static charge which may cause spark and become an ignition source. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Acetone (CAS 67-64-1)	PEL	2400 mg/m3
		1000 ppm
Ethanol (CAS 64-17-5)	PEL	1900 mg/m3
		1000 ppm
Methyl isobutyl ketone (CAS 108-10-1)	PEL	410 mg/m3
		100 ppm
n-Butyl acetate (CAS 123-86-4)	PEL	710 mg/m3
		150 ppm
Propane (CAS 74-98-6)	PEL	1800 mg/m3
		1000 ppm
ylene (CAS 1330-20-7)	PEL	435 mg/m3
		100 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Acetone (CAS 67-64-1)	STEL	500 ppm
	TWA	250 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Butane (CAS 106-97-8)	STEL	1000 ppm
Ethanol (CAS 64-17-5)	STEL	1000 ppm
Methyl isobutyl ketone (CAS 108-10-1)	STEL	75 ppm
	TWA	20 ppm
n-Butyl acetate (CAS 123-86-4)	STEL	200 ppm
	TWA	150 ppm
ylene (CAS 1330-20-7)	STEL	150 ppm
	TWA	100 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Acetone (CAS 67-64-1)	TWA	590 mg/m3
		250 ppm
Butane (CAS 106-97-8)	TWA	1900 mg/m3
		800 ppm
Ethanol (CAS 64-17-5)	TWA	1900 mg/m3
		1000 ppm
Methyl isobutyl ketone (CAS 108-10-1)	STEL	300 mg/m3
		75 ppm
	TWA	205 mg/m3
		50 ppm
n-Butyl acetate (CAS 123-86-4)	STEL	950 mg/m3
		200 ppm
	TWA	710 mg/m3
		150 ppm
Propane (CAS 74-98-6)	TWA	1800 mg/m3
		1000 ppm
ylene (CAS 1330-20-7)	STEL	655 mg/m3
		150 ppm
	TWA	435 mg/m3
		100 ppm

US. Workplace Environmental Exposure Level (WEEL) Guides

Components	Type	Value
2-Methoxy-1-methylethyl acetate (CAS 108-65-6)	TWA	50 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Acetone (CAS 67-64-1)	25 mg/l	Acetone	Urine	
Methyl isobutyl ketone (CAS 108-10-1)	1 mg/l	Methyl isobutyl ketone	Urine	
ylene (CAS 1330-20-7)	1.5 g/g	Methylhippuric acids	Creatinine in urine	

- For sampling details, please see the source document.

Exposure guidelines

US - California OELs: Skin designation

2-Methoxy-1-methylethyl acetate (CAS 108-65-6) Can be absorbed through the skin.

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
Skin protection	
Other	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.
Respiratory protection	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Observe any medical surveillance requirements. When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Aerosol.
Color	Various.
Odor	Characteristic.
Odor threshold	Not available.
pH	Not determined.
Melting point/freezing point	Not applicable.
Initial boiling point and boiling range	Not available.
Flash point	32.0 °F (0 °C) (Without propellant gas)
Evaporation rate	Not available.
Flammability (solid, gas)	Extremely flammable aerosol.
Upper/lower flammability or explosive limits	
Explosive limit - lower (%)	1.5
Explosive limit - upper (%)	13
Vapor pressure	3600 hPa (20°C)
Vapor density	Not determined.
Relative density	Not determined.
Solubility(ies)	
Solubility (water)	Immiscible in water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	689 °F (365 °C)
Decomposition temperature	Not determined.
Viscosity	Not determined.
Other information	Solid content: 17.3 % Organic solvents content: 82.7 %
Density	Not determined.
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.

Possibility of hazardous reactions	Aerosol containers can explode when heated, due to excessive pressure build-up.
Conditions to avoid	Aerosol containers are unstable at temperatures above 50°C. Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents. Strong acids. Alkalis.
Hazardous decomposition products	Thermal decomposition of this product can generate carbon monoxide and carbon dioxide.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause damage to organs through prolonged or repeated exposure by inhalation. May cause drowsiness and dizziness.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye irritation.
Ingestion	Not likely, due to the form of the product.
Symptoms related to the physical, chemical and toxicological characteristics	May cause drowsiness and dizziness. Headache. Severe eye irritation. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity Not expected to be acutely toxic.

Components	Species	Test Results
2-Methoxy-1-methylethyl acetate (CAS 108-65-6)		
Acute		
Dermal		
LD50	Rabbit	> 5000 mg/kg
Oral		
LD50	Rat	> 8532 mg/kg
Acetone (CAS 67-64-1)		
Acute		
Dermal		
LD50	Rabbit	> 15700 mg/kg, 24 Hours
Inhalation		
LC50	Rat	76 mg/l, 4 Hours
Oral		
LD50	Rat	5800 mg/kg
Ethanol (CAS 64-17-5)		
Acute		
Inhalation		
LC50	Mouse	39 g/m3, 4 Hours
Oral		
LD50	Rat	7000 - 11000 mg/kg
n-Butyl acetate (CAS 123-86-4)		
Acute		
Inhalation		
LC50	Rat	2000 ppm, 4 Hours
Oral		
LD50	Rat	10768 mg/kg
Propane (CAS 74-98-6)		
Acute		
Inhalation		
LC50	Rat	1355 mg/l

Components	Species	Test Results
ylene (CAS 1330-20-7)		
Acute		
Oral		
LD50	Rat	3523 mg/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes serious eye irritation.

Respiratory or skin sensitization

Respiratory sensitization Due to partial or complete lack of data the classification is not possible.

Skin sensitization Due to partial or complete lack of data the classification is not possible.

Germ cell mutagenicity Due to partial or complete lack of data the classification is not possible.

Carcinogenicity Suspected of causing cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Methyl isobutyl ketone (CAS 108-10-1) 2B Possibly carcinogenic to humans.
ylene (CAS 1330-20-7) 3 Not classifiable as to carcinogenicity to humans.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Reproductive toxicity Due to partial or complete lack of data the classification is not possible.

Specific target organ toxicity - single exposure May cause drowsiness and dizziness.

Specific target organ toxicity - repeated exposure May cause damage to organs (Central nervous system, Liver, Kidney) through prolonged or repeated exposure.

Aspiration hazard Not an aspiration hazard.

Chronic effects Organic solvents may be absorbed into the body by inhalation and cause permanent damage to the nervous system, including the brain.

Further information No data available.

12. Ecological information

Ecotoxicity The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components		Species	Test Results
2-Methoxy-1-methylethyl acetate (CAS 108-65-6)			
Aquatic			
Acute			
Fish	LC50	Oryzias latipes	> 100 mg/l, 96 hours
Acetone (CAS 67-64-1)			
Aquatic			
Acute			
Crustacea	LC50	Daphnia	8800 mg/l, 48 Hours
Fish	LC50	Pimephales promelas	7163 mg/l, 96 Hours
Ethanol (CAS 64-17-5)			
Aquatic			
Acute			
Crustacea	LC50	Ceriodaphnia dubia	5012 mg/l, 48 hours
		Daphnia magna	454 mg/l, 11 days
Fish	LC50	Pimephales promelas	13480 mg/l, 96 hours
Chronic			
Crustacea	NOEC	Ceriodaphnia dubia	9.6 mg/l, 10 days

Components		Species	Test Results
ylene (CAS 1330-20-7)			
Aquatic			
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	2.6 mg/l, 96 hours

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)

Ethanol (CAS 64-17-5)	-0.31
ylene (CAS 1330-20-7)	3.2

Mobility in soil No data available.

Mobility in general The product is immiscible with water and will spread on the water surface.

Other adverse effects The product contains volatile organic compounds which have a photochemical ozone creation potential.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Contents under pressure. Do not puncture, incinerate or crush. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Professional users should carefully puncture used aerosol containers to release any residual gas, before recycling or disposal along with other trade waste. Leaking aerosols should be placed immediately in a well-ventilated area until leakage has stopped, after which it should be disposed of as above. Empty aerosol containers are safe for disposal along with normal domestic refuse (special arrangements may apply locally). Since aerosols are designated as "hazardous waste" they may only be returned to a supplier who holds an appropriate waste handling licence.

Hazardous waste code Empty aerosol containers before disposal.
D001: Waste Flammable material with a flash point 140 F

Waste from residues / unused products Professional users should carefully puncture used aerosol containers to release any residual gas, before recycling or disposal along with other trade waste. Leaking aerosols should be placed immediately in a well-ventilated area until leakage has stopped, after which it should be disposed of as above. Empty aerosol containers are safe for disposal along with normal domestic refuse (special arrangements may apply locally). Since aerosols are designated as "hazardous waste" they may only be returned to a supplier who holds an appropriate waste handling licence.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

14. Transport information

DOT

UN number UN1950
UN proper shipping name Aerosols
Transport hazard class(es)
Class 2.1
Subsidiary risk -
Label(s) 2.1
Packing group Not applicable.
Environmental hazards
Marine pollutant No
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Packaging exceptions 306
Packaging non bulk None
Packaging bulk None

IATA

UN number UN1950
UN proper shipping name Aerosols
Transport hazard class(es)
Class 2.1
Subsidiary risk -
Label(s) 2.1
Packing group Not applicable.

Environmental hazards No
ERG Code 10L
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number UN1950
UN proper shipping name AEROSOLS
Transport hazard class(es)
Class 2.1
Subsidiary risk -
Label(s) 2.1
Packing group Not applicable.
Environmental hazards
Marine pollutant No
EmS F-D, S-U
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Acetone (CAS 67-64-1)	LISTED
Butane (CAS 106-97-8)	LISTED
Methyl isobutyl ketone (CAS 108-10-1)	LISTED
n-Butyl acetate (CAS 123-86-4)	LISTED
Nitrocellulose (CAS 9004-70-0)	LISTED
Propane (CAS 74-98-6)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
ylene	1330-20-7	5-10
Methyl isobutyl ketone	108-10-1	2.5-5.0

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Methyl isobutyl ketone (CAS 108-10-1)
ylene (CAS 1330-20-7)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Butane (CAS 106-97-8)
Propane (CAS 74-98-6)

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Acetone (CAS 67-64-1)	6532
Methyl isobutyl ketone (CAS 108-10-1)	6715

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Acetone (CAS 67-64-1)	35 %WV
Methyl isobutyl ketone (CAS 108-10-1)	35 %WV

DEA Exempt Chemical Mixtures Code Number

Acetone (CAS 67-64-1)	6532
Methyl isobutyl ketone (CAS 108-10-1)	6715

US state regulations

US. Massachusetts RTK - Substance List

Acetone (CAS 67-64-1)
Butane (CAS 106-97-8)
Ethanol (CAS 64-17-5)
Methyl isobutyl ketone (CAS 108-10-1)
n-Butyl acetate (CAS 123-86-4)
Nitrocellulose (CAS 9004-70-0)
Propane (CAS 74-98-6)

US. New Jersey Worker and Community Right-to-Know Act

Acetone (CAS 67-64-1)
Butane (CAS 106-97-8)
Ethanol (CAS 64-17-5)
Methyl isobutyl ketone (CAS 108-10-1)
n-Butyl acetate (CAS 123-86-4)
Nitrocellulose (CAS 9004-70-0)
Propane (CAS 74-98-6)
ylene (CAS 1330-20-7)

US. Pennsylvania Worker and Community Right-to-Know Law

Acetone (CAS 67-64-1)
Butane (CAS 106-97-8)
Ethanol (CAS 64-17-5)
Methyl isobutyl ketone (CAS 108-10-1)
n-Butyl acetate (CAS 123-86-4)
Nitrocellulose (CAS 9004-70-0)
Propane (CAS 74-98-6)
ylene (CAS 1330-20-7)

US. Rhode Island RTK

Acetone (CAS 67-64-1)
Butane (CAS 106-97-8)
Methyl isobutyl ketone (CAS 108-10-1)
n-Butyl acetate (CAS 123-86-4)
Propane (CAS 74-98-6)
ylene (CAS 1330-20-7)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Methyl isobutyl ketone (CAS 108-10-1)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 05-July-2016

Revision date -

Version # 01

NFPA ratings

List of abbreviations

LD50: Lethal Dose 50%.
LC50: Lethal Concentration, 50%.
NOEC: No observed effect concentration.

References

In-house data
US. IARC Monographs on Occupational Exposures to Chemical Agents
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
IARC Monographs. Overall Evaluation of Carcinogenicity

Disclaimer

HC Farver A/S cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user s responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Trade name	:	ALEXIT-Wischfüller 491-20 7808 achatgrau
Use of the Substance/Mixture	:	Industrial serial painting
Company	:	Mankiewicz Coatings L.L.C 415 Jessen Lane Charleston, South Carolina 29492 USA
Telephone	:	+1 843 654-7755
Emergency telephone	:	CHEMTREC 800-424-9300 or 703-527-3887

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Caution

Form: liquid, Color: according product name, Odor: characteristic

OSHA Hazards : MODERATE EYE IRRITANT

Potential Health Effects

Inhalation	:	No hazard in normal industrial use.
Skin	:	No hazard in normal industrial use.
Eyes	:	May cause eye irritation.
Ingestion	:	May cause vomiting.

Carcinogenicity:

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture of synthetic resins and pigments

Hazardous ingredients

Component	CAS-No.	Weight %
phosphoric acid polyester(72243-070628, Germany)		1.00 - 5.00

SECTION 4. FIRST AID MEASURES

First aid procedures

General advice : In all cases of doubt, or when sickness symptoms persist, seek medical attention.
Never give anything by mouth to an unconscious person.

Inhalation : Remove to fresh air, keep patient warm and at rest.
Call a doctor, should the air passages be affected

Skin contact : Take off all contaminated clothing immediately.
Wash skin thoroughly with soap and water or use recognised skin cleanser.
Do NOT use solvents or thinners !

Eye contact : Remove contact lenses, irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart and seek medical advice.

Ingestion : Do NOT induce vomiting.
If accidentally swallowed obtain immediate medical attention.
Never give anything by mouth to an unconscious person.
Keep at rest.

SECTION 5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point : 374 °F (190 °C)
Method: ISO 2719

Ignition temperature : Remarks: no data available

Lower explosion limit : Remarks: no data available

Upper explosion limit : Remarks: no data available

Fire fighting

Suitable extinguishing media : Not combustible under normal conditions.
Use extinguishing measures that are appropriate to local

circumstances and the surrounding environment.

Further information : DO NOT ALLOW RUN-OFF FROM FIRE FIGHTING TO ENTER DRAINS OR WATER COURSES!!

Protective equipment and precautions for firefighters

Specific hazards during fire fighting : Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard.

Special protective equipment for fire-fighters : As in any fire, wear self-contained breathing apparatus pressure - demand, MSHA / NIOSH (approved or equivalent) and full protective gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Take the precautions customary when handling chemicals. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Do not let product enter drains.
If the product contaminates lakes, rivers or sewage, inform appropriate authorities in accordance with local regulations.

Methods for containment / Methods for cleaning up : Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see chapter 13).
Clean preferably with a detergent; avoid use of solvents.

SECTION 7. HANDLING AND STORAGE

Handling

Handling : Avoid contact with the skin and the eyes.
Comply with the health and safety at work laws.
Smoking, eating and drinking should be prohibited in the application area.
Observe specific national regulations for handling and use of paints.

Advice on protection against fire and explosion : No special protective measures against fire required.

Storage

Requirements for storage areas and containers : Keep container tightly closed. Never use pressure to empty: container isnot a pressure vessel. No smoking. Prevent unauthorized access.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Further information on storage conditions : Always keep in containers of same material as the original one. See also instructions on the label. Avoid heating and

direct sunlight.
Keep container dry in a cool, well-ventilated place.

Advice on common storage : Keep away from oxidizing agents and strongly acid or alkaline materials.

Storage temperature : 41 - 95 °F (5 - 35 °C)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Ingredients with workplace control parameters

Ingredients Source	Value	Control parameters
CYCLOHEXANONE CAS-No.108-94-1		
ACGIH	TWA	20 ppm
ACGIH	STEL	50 ppm
OSHA P1	TWA	50 ppm 200 mg/m3
OSHA P0	TWA	25 ppm 100 mg/m3

Engineering measures

Engineering measures : Provide adequate ventilation. This should be achieved by the use of local exhaust ventilation and good general extraction.

Personal protective equipment

Protective measures : Avoid product contact with skin, eyes and clothing.
Avoid the inhalation of dust from sanding, particulates and spray mist arising from the application of this preparation.

Eye protection : Use safety glasses or face shield (ANSI Z87.1 or approved equivalent).

Hand protection : Glove permeation data does not exist for this material.
The following glove(s) should be used for splash protection only:
Appropriate material: nitrile

Skin and body protection : Personal should wear protective clothing as necessary to prevent skin contact. All parts of the body should be washed after contact.

Respiratory protection : None, but avoid breathing vapors if possible.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	:	liquid
Color	:	according product name
Odor	:	characteristic

Safety data

Flash point	:	374 °F (190 °C) Method: ISO 2719
Ignition temperature	:	Remarks: no data available
Lower explosion limit	:	Note: no data available
Upper explosion limit	:	Note: no data available
Boiling point/boiling range	:	ca. 248 °F (120 °C)
Vapor pressure	:	ca. 100 hPa (75 mmHg) at 122 °F (50 °C)
Density	:	ca.15.9 lb/gal (1.9 g/cm3) at 68 °F (20 °C)
Water solubility	:	Note: insoluble
Flow time	:	> 150 s 4 mm Method: DIN 53211

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	:	Remarks: Stable under recommended storage and handling conditions (See section 7).
Materials to avoid	:	Remarks: Keep away from oxidizing agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.
Hazardous decomposition products	:	Note: No hazardous decomposition products known.

SECTION 11. TOXICOLOGICAL INFORMATION

Further information	:	Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin. The liquid splashed in the eyes may cause irritation and reversible damage.

SECTION 12. ECOLOGICAL INFORMATION

Additional ecological information : There are no data available on the preparation itself.

SECTION 13. DISPOSAL CONSIDERATIONS

Further information : Dispose of in accordance with local regulations.

SECTION 14. TRANSPORT INFORMATION

DOT
Not dangerous goods

IATA
Not dangerous goods

IMDG
Not dangerous goods

Other information : If transported within the user's premises: To be transported always in closed, upright and safe containers. Make sure that persons handling these containers are aware of the rules of conduct in case of incident or spillage.

Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

OSHA Hazards : Moderate eye irritant

TSCA Status : y (positive listing)
All of the components of this product are either listed in the TSCA inventory or are not subject to the notification requirements(exempt).

SARA 311/312 Hazards : Acute Health Hazard

Clean Air Act
Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO - KNOW

SARA 302 Reportable Quantity : SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

US CAA HAP
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

CAA112(r)
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

CAA111

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

California Prop. 65 Ingredients : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

US Federal Regulations

Volatile organic compounds (VOC) content : VOC content excluding water:
0.01 lb/gal (0.00 g/cm3)

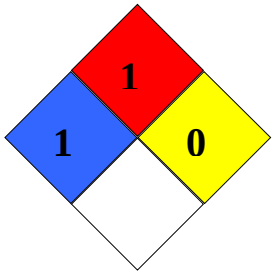
This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

SECTION 16. OTHER INFORMATION

Further information

HMIS Classification : Health Hazard: 2
Flammability: 1
Physical hazards: 0

NFPA Classification : Health Hazard: 1
Fire Hazard: 1
Reactivity Hazard: 0



Department issuing safety data sheet

UMCO Umwelt Consult GmbH
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The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : ALEXIT-Decklack 402-40 RAL 5003 saphirblau seidenglänzend

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Industrial serial painting

1.3 Details of the supplier of the safety data sheet

Company : Mankiewicz Gebr. & Co.
(GmbH & Co. KG)
Georg-Wilhelm-Straße 189
21107 Hamburg
Telephone : +4940751030
Telefax : +494075103375
E-mail address : sdb_info@umco.de

1.4 Emergency telephone number

+49 (0) 551 / 19240 (Toxic agent information centre North / NORD)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Flammable liquids , Category 3	H226: Flammable liquid and vapour.
Specific target organ toxicity - single exposure , Category 3, Central nervous system	H336: May cause drowsiness or dizziness.
Chronic aquatic toxicity , Category 3	H412: Harmful to aquatic life with long lasting effects.

Classification (67/548/EEC, 1999/45/EC)

Flammable	R10: Flammable.
	R66: Repeated exposure may cause skin dryness or cracking.
	R67: Vapours may cause drowsiness and dizziness.
Dangerous for the environment	R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic

environment.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Warning

Hazard statements :	H226	Flammable liquid and vapour.
	H336	May cause drowsiness or dizziness.
	H412	Harmful to aquatic life with long lasting effects.
Supplemental Hazard Statements :	EUH066	Repeated exposure may cause skin dryness or cracking.
Precautionary statements :	**Prevention:**	
	P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
	P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
	P273	Avoid release to the environment.
	Response:	
	P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
	P312	Call a POISON CENTER or doctor/ physician if you feel unwell.
	P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Hazardous components which must be listed on the label:
123-86-4 n-butyl acetate

2.3 Other hazards

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).
This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Chemical nature : Mixture of synthetic resins, organic solvents and pigments

Hazardous components

Chemical Name CAS-No. EC-No. Registration number Remarks	Classification (67/548/EEC)	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]
Trizincbisorthophosphate/zinc oxide mixture	N; R51/53	Aquatic Chronic 2; H411	>= 2,5 - < 5
4-hydroxy-4-methylpentan-2-one 123-42-2 204-626-7 01-2119473975-21	Xi; R36	Eye Irrit. 2; H319	>= 1 - < 5
acetylacetone 123-54-6 204-634-0	R10 Xn; R22	Flam. Liq. 3; H226 Acute Tox. 4; H302	>= 1 - < 5
xylene 1330-20-7 215-535-7 01-2119488216-32 Note C	R10 Xn; R20/21 Xi; R38	Flam. Liq. 3; H226 Acute Tox. 4; H332 Acute Tox. 4; H312 Skin Irrit. 2; H315	>= 1 - < 5
low boiling point naphtha - unspecified 64742-95-6 265-199-0 01-2119455851-35 Note H (Table 3.1), Note P	R10 Xn; R65 Xi; R37 N; R51/53 R66 R67	Flam. Liq. 3; H226 STOT SE 3; H335, H336 Asp. Tox. 1; H304 Aquatic Chronic 2; H411	>= 0,5 - < 1
N-methyl-2-pyrrolidone 872-50-4 212-828-1 01-2119472430-46	Repr.Cat.2; R61 Xi; R36/37/38	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Repr. 1B; H360D STOT SE 3; H335	>= 0,1 - < 0,25
WEL substance :			
n-butyl acetate 123-86-4 204-658-1 01-2119485493-29	R10 R66 R67	Flam. Liq. 3; H226 STOT SE 3; H336	>= 20 - < 25

For the full text of the R-phrases mentioned in this Section, see Section 16.
For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : In all cases of doubt, or when sickness symptoms persist,

seek medica lattention.
Never give anything by mouth to an unconscious person.

If inhaled	:	Remove to fresh air, keep patient warm and at rest. Irregular breathing/no breathing: artificial respiration. If unconscious place in recovery position and seek medical advice.
In case of skin contact	:	Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognised skin cleanser. Do NOT use solvents or thinners !
In case of eye contact	:	Remove contact lenses, irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart and seek medical advice.
If swallowed	:	Do NOT induce vomiting. If accidentally swallowed obtain immediate medical attention. Never give anything by mouth to an unconscious person. Keep at rest.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	:	No information available.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	No information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Alcohol resistant foam, CO2, powders, water spray
Unsuitable extinguishing media	:	High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard.
Hazardous combustion products	:	

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Appropriate breathing apparatus may be required.

Further information	:	Cool endangered containers with water in case of fire. DO NOT ALLOW RUN-OFF FROM FIRE FIGHTING TO ENTER DRAINS OR WATER COURSES!!

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Exclude sources of ignition and ventilate the area. Do not inhale vapours. Refer to protective measures listed in sections 7 and 8.

6.2 Environmental precautions

Environmental precautions	:	Do not let product enter drains. If the product contaminates lakes, rivers or sewage, inform appropriate authorities in accordance with local regulations.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up	:	Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see chapter 13). Clean preferably with a detergent; avoid use of solvents.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the occupational exposure limits. Comply with the health and safety at work laws. Smoking, eating and drinking should be prohibited in the application area. Observe specific national regulations for handling and use of paints.
Advice on protection against fire and explosion	:	The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Preparation may charge electrostatically: always use earthing leads whentransferring from one container to

another. Operators should wear anti-static footwear and clothing. No sparking tools should be used. Vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Electrical equipment should be protected to the appropriate standard. Floors should be of the conducting type. Keep container tightly closed. Never use pressure to empty: container isnot a pressure vessel. No smoking. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Further information on storage conditions	:	Always keep in containers of same material as the original one. See also instructions on the label. Avoid heating and direct sunlight. Keep container dry in a cool, well-ventilated place.
Advice on common storage	:	Keep away from oxidising agents and strongly acid or alkaline materials.
Storage temperature	:	5 - 35 °C

7.3 Specific end use(s)

Specific use(s)	:	This information is not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

CAS-No.	Source	Value	Ceiling Limit Value	Update
n-butyl acetate				
123-86-4 204-658-1	Occupational Exposure Standards (OESs) / EH40	150 ml/m3 724 mg/m3		01.09.2003
4-hydroxy-4-methylpentan-2-one				
123-42-2 204-626-7	Occupational Exposure Standards (OESs) / EH40	50 ml/m3 241 mg/m3		01.09.2003
xylene				
1330-20-7	Occupational	50 ml/m3		01.09.2003

215-535-7	Exposure Standards (OESs) / EH40	220 mg/m3		
Further information:	Sk			
1330-20-7 215-535-7	2000/39/EC	50 ml/m3 221 mg/m3		08.06.2000
Further information:	Skin			
N-methyl-2-pyrrolidone				
872-50-4 212-828-1	Occupational Exposure Standards (OESs) / EH40	25 ml/m3 103 mg/m3		01.09.2003
Further information:	Sk			

8.2 Exposure controls

Engineering measures

Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain aerosol- and solvent vapours concentration below the OEL, suitable respiratory protection must be worn.

Personal protective equipment

Eye protection : Wear safety goggles to protect against solvent splashes.

Hand protection

Remarks : Adhere to the professional organisation rule “Use of protective gloves”. Appropriate chemicals resistant glove tested in compliance with EN 374.
Recommendation for protection against components generally found in the products:

For short-term contact (i.e. splash protection):
Appropriate material:
nitrile rubber, Neoprene
Material thickness: > 0,4 mm
Breakthrough time: > 480 min

Before use, the protective glove should be tested in any case for its specific work-station suitability (i.e. mechanical resistance, product compatibility and antistatic properties). Adhere to the manufacturer’s instructions and information relating to the use, storage, care and replacement of protective gloves. Protective gloves shall be replaced immediately when physically damaged or worn. Preventive hand protection (skin protection cream) recommended. Wash

immediately contaminated skin. Design operations thus to avoid permanent use of protective gloves.

Skin and body protection : Personal should wear antistatic clothings made of natural fiber or ofhigh temperature resistant synthetic fiber. All parts of the body shouldbe washed after contact.

Respiratory protection : If workers are exposed to concentrations above the exposure limit they must use appropriate, certified respirators.
Use half-mask model with cartridge or air-fed.
Dry grinding, torch cutting and/or welding however can produce hazardous dust and/or vapour.
If possible, machine employing a wet medium.
Where practicable, install exhaust hoods to improve capture of vapours and fumes and avoid exposition; otherwise wear respiratory protection equipment.

Protective measures : Do not eat or drink during work - no smoking.
Avoid product contact with skin, eyes and clothing.
Avoid the inhalation of dust from sanding, particulates and spray mist arising from the application of this preparation.
When operators, whether spraying or not, have to work inside the spray booth, ventilation is unlikely to be sufficient to control particulates and solvent vapour in all cases. In such circumstances they should wear a compressed air-fed respirator during the spraying process until such time as the particulates and solvent vapour concentration has fallen below the exposure limits.

Environmental exposure controls

General advice : Do not let product enter drains.
If the product contaminates lakes, rivers or sewage, inform appropriate authorities in accordance with local regulations.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	liquid
Colour	:	according product name
Odour	:	characteristic
Odour Threshold	:	no data available
pH	:	no data available

Melting point/range	:	no data available
Boiling point/boiling range	:	ca. 120 °C
Flash point	:	28 °C Method: ISO 2719
Evaporation rate	:	no data available
Flammability (solid, gas)	:	no data available
Burning rate	:	no data available
Lower explosion limit	:	1 %(V)
Upper explosion limit	:	10 %(V)
Vapour pressure	:	100 hPa at 50 °C
Relative vapor density	:	no data available
Relative density	:	no data available
Density	:	1,7 g/cm3 at 20 °C
Water solubility	:	insoluble
Solubility in other solvents	:	no data available
Partition coefficient: n-octanol/water	:	no data available
Ignition temperature	:	> 400 °C
Thermal decomposition	:	no data available
Flow time	:	61 - 90 s Cross section: 4 mm Method: DIN 53211
Explosive properties	:	no data available
Oxidizing properties	:	no data available

9.2 Other information

none

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	No dangerous reaction known under conditions of normal use. There are no data available on the preparation itself.

10.4 Conditions to avoid

Conditions to avoid	:	Stable under recommended storage and handling conditions (See section 7).

10.5 Incompatible materials

Materials to avoid	:	Keep away from oxidizing agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.

10.6 Hazardous decomposition products

Hazardous decomposition products	:	When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide and dioxide, smoke, oxides of nitrogen.
Other information	:	When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide and dioxide, smoke, oxides of nitrogen.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Product:

Acute oral toxicity	:	Acute toxicity estimate : > 2.000 mg/kg Method: Calculation method
Acute inhalation toxicity	:	Acute toxicity estimate : > 20 mg/l Test atmosphere: vapour Method: Calculation method
Acute dermal toxicity	:	Acute toxicity estimate : > 2.000 mg/kg Method: Calculation method
Further information	:	Exposure of vapour concentration in excess of the stated

OEL's may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on kidney, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue muscular weakness, drowsiness and in extrem cases, loss of consciousness., Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin., The liquid splashed in the eyes may cause irritation and reversible damage.

: The product was classified in toxicological terms on the basis of the results of the calculation procedure outlined within General Directive on Preparations (1999/45/EC).

Components:

4-hydroxy-4-methylpentan-2-one, 123-42-2

Acute oral toxicity	:	LD50 rat: 4.000 mg/kg
Acute dermal toxicity	:	LD50 rabbit: 13.630 mg/kg

acetylacetone, 123-54-6

Acute oral toxicity	:	LD50 rat: 575 mg/kg Method: OECD Test Guideline 401
Acute dermal toxicity	:	LD50 rabbit: 4.870 mg/kg
Respiratory or skin sensitization	:	Result: Did not cause sensitization on laboratory animals.

xylene, 1330-20-7

Acute oral toxicity	:	LD50 rat: 4.300 mg/kg

SECTION 12: Ecological information

12.1 Toxicity

Product:

Ecotoxicology Assessment

Acute aquatic toxicity	:	There are no data available on the preparation itself.

12.2 Persistence and degradability

Product:

Biodegradability	:	There are no data available on the preparation itself.

12.3 Bioaccumulative potential

Product:

Bioaccumulation	:	There are no data available on the preparation itself.

12.4 Mobility in soil

Product:

Mobility	:	There are no data available on the preparation itself.

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)., This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

12.6 Other adverse effects

Product:

Additional ecological information	:	There are no data available on the preparation itself. The product should not be allowed to enter drains or water courses.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	The listed waste code numbers, according to the European Waste Catalogue, are to be understood as a recommendation. A final decision must be made in agreement with the regional waste disposal company.
Contaminated packaging	:	Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse. Packaging that cannot be cleaned should be disposed off in agreement with the regional waste disposal company.
Waste key for the unused product	:	080111 waste paint and varnish containing organic solvents or other dangerous substances

SECTION 14: Transport information

14.1 ADR

UN Number	:	1263
Description of the goods	:	PAINT
Class	:	3
Packaging group	:	III
Classification Code	:	F1
Hazard identification No	:	30
ADR/RID-Labels	:	3
Tunnel restriction code	:	Tunnelcode D/E Special Provision 640E
Environmentally hazardous	:	no

14.2 IMDG

Substance No.	:	UN 1263
Description of the goods	:	PAINT
Class	:	3
Packaging group	:	III
IMDG-Labels	:	3
EmS Number	:	F-E, S-E
Marine Pollutant	:	no

14.3 IATA

UN Number	:	1263
Description of the goods	:	PAINT
Class	:	3
Packaging group	:	III
ICAO-Labels	:	3
Packing instruction (cargo aircraft)	:	366
Environmentally hazardous	:	no
Packing instruction (passenger aircraft)	:	355
Packing instruction (passenger aircraft)	:	Y344

14.4 Other information

: If transported within the user's premises: To be transported always in closed, upright and safe containers. Make sure that persons handling these containers are aware of the rules of conduct in case of incident or spillage.

Receptacles with less than 450 litres capacity, are not subject to ADR (see ADR 2.2.3.1.5)

Receptacles with less than 30 litres capacity, are not subject to the regulations of IMDG chapters 4.1, 5.2 and 6.1 (see IMDG 2.3.2.5)

14.5 Environmental hazards
Information on environmental hazards, if relevant, pls. see 14.1 - 14.3.

14.6 Special precautions for user
For personal protection see section 8.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Directive 1999/13/EC	:	VOC content excluding water	27 % 475 g/l
Other regulations	:	The information given in this material safety data sheet does not release the user from its duty of risk assessment and control in the work place defined in other health and safety law. Adhere to the national sanitary and occupational safety regulations when using this product.	

15.2 Chemical Safety Assessment

SECTION 16: Other information

Full text of R-Phrases

R10	Flammable.
R20/21	Harmful by inhalation and in contact with skin.
R22	Harmful if swallowed.
R36	Irritating to eyes.
R36/37/38	Irritating to eyes, respiratory system and skin.
R37	Irritating to respiratory system.
R38	Irritating to skin.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R61	May cause harm to the unborn child.
R65	Harmful: may cause lung damage if swallowed.
R66	Repeated exposure may cause skin dryness or cracking.
R67	Vapours may cause drowsiness and dizziness.

Full text of H-Statements

H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H360D	May damage the unborn child.
H411	Toxic to aquatic life with long lasting effects.
Acute Tox.	Acute toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.

Further information

Note C	Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers.
Note H (Table 3.1)	The classification and labelling shown for this substance applies to the hazardous property(ies) indicated by the hazard statement(s) in combination with the hazard class(es) and category(ies) shown. The requirements of Article 4 for manufacturers, importers or downstream users of this substance apply to all other hazard classes and categories. For hazard classes where the route of exposure or the nature of the effects leads to a differentiation of the classification of the hazard class, the manufacturer, importer or downstream user is required to consider the routes of exposure or the nature of the effects not already considered. The final label shall follow the requirements of Article 17 and of section 1.2 of Annex I.
Note P	The classification as a carcinogen or mutagen need not apply if it can be shown that the substance contains less than 0,1 % w/w benzene (EINECS No 200-753-7). When the substance is not classified as a carcinogen at least the precautionary statements (P102-)P260-P262-P301 + P310-P331 (Table 3.1) or the S-phrases (2-)23-24-62 (Table 3.2) shall apply. This note applies only to certain complex oil-derived substances in Part 3.

Further information

Other information : This safety datasheet complies with the requirements of regulation (EC) No 1907/2006(453/2010).

Department issuing safety data sheet

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SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	:	ALEXIT-Zusatz / Hardener 495-20
Use of the Substance/Mixture	:	Industrial serial painting
Company	:	Mankiewicz Coatings L.L.C 415 Jessen Lane Charleston, South Carolina 29492 USA
Telephone	:	+1 (843) 6547755
Emergency Telephone	:	CHEMTREC +1 (800) 4249300 or +1 (703) 5273887

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Warning

Form: liquid, Color: according product name, Odor: characteristic

OSHA Hazards : TOXIC BY INHALATION.
RESPIRATORY SENSITIZER
SKIN SENSITIZER
MODERATE SKIN IRRITANT
MODERATE EYE IRRITANT
MODERATE RESPIRATORY IRRITANT
CARCINOGEN

Potential Health Effects

Inhalation	:	Harmful if inhaled. May cause allergic respiratory reaction. May cause respiratory tract irritation. Individuals with lung or breathing problems or prior reaction to isocyanates must not be exposed to vapor or spray mist.
Skin	:	May cause allergic skin reaction. May cause skin irritation.
Eyes	:	May cause eye irritation.
Ingestion	:	May cause vomiting.
Chronic Exposure	:	Suspect cancer hazard - contains material which may cause cancer.
Symptoms of Overexposure	:	No information available.

Carcinogenicity:

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	Confirmed animal carcinogen with unknown relevance to humans: The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure. CYCLOHEXANONE 108-94-1

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Hardener based on polyisocyanates

Hazardous ingredients

Component	CAS-No.	Weight %
Diphenylmethanediisocyanate	9016-87-9	60.00 - 100.00
CYCLOHEXANONE	108-94-1	0.10 - 1.00

SECTION 4. FIRST AID MEASURES

First aid procedures

General advice : In all cases of doubt, or when sickness symptoms persist, seek medical attention.
Never give anything by mouth to an unconscious person.

Inhalation : Remove to fresh air, keep patient warm and at rest.
Irregular breathing/no breathing: artificial respiration.
If unconscious place in recovery position and seek medical advice.

Skin contact : Take off all contaminated clothing immediately.
Wash skin thoroughly with soap and water or use recognised skin cleanser.
Do NOT use solvents or thinners !

Eye contact : Remove contact lenses, irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart and seek medical advice.

Ingestion	:	Do NOT induce vomiting. If accidentally swallowed obtain immediate medical attention. Never give anything by mouth to an unconscious person. Keep at rest.

Notes to physician

Symptoms	:	No information available.
Treatment	:	No information available.

SECTION 5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point	:	464 °F (240 °C) Method: ISO 2719
Ignition temperature	:	> 752 °F (> 400 °C)
Lower explosion limit	:	1.0 %(V)
Upper explosion limit	:	10.0 %(V)

Fire fighting

Suitable extinguishing media	:	Alcohol resistant foam, CO2, powders, water spray
Unsuitable extinguishing media	:	High volume water jet
Further information	:	Cool endangered containers with water in case of fire. DO NOT ALLOW RUN-OFF FROM FIRE FIGHTING TO ENTER DRAINS OR WATER COURSES!!

Protective equipment and precautions for firefighters

Specific hazards during fire fighting	:	Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard.
Special protective equipment for fire-fighters	:	As in any fire, wear self-contained breathing apparatus pressure - demand, MSHA / NIOSH (approved or equivalent) and full protective gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Exclude sources of ignition and ventilate the area. Do not inhale vapors. Refer to protective measures listed in sections 7 and 8.
Environmental precautions	:	Do not let product enter drains. If the product contaminates lakes, rivers or sewage, inform appropriate authorities in accordance with local regulations.

Add the same decontaminant to the remnants and let stand for several days until no further reaction in non-sealed container. Once this stage is reached, close container and dispose according to local regulations.

Methods for containment / Methods for cleaning up : Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see chapter 13).
Clean preferably with a detergent; avoid use of solvents.

Additional advice : Immediately clean contaminated areas with following substances:

Water	45 Vol.%
Ethanol or Isopropyl Alcohol	50 Vol.%
Ammonia solution (density=0,88)	5 Vol.%

Alternative applicable to that (not flammable):

Sodium Carbonate	5 Vol.%
Water	95 Vol.%

SECTION 7. HANDLING AND STORAGE

Handling

Handling : Persons with a history of asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this preparation is used !
Prevent the creation of flammable or explosive concentrations of vapor in air and avoid vapor concentrations higher than the occupational exposure limits.
Comply with the health and safety at work laws.
Smoking, eating and drinking should be prohibited in the application area.

Advice on protection against fire and explosion : The product should only be used in areas from which all naked lights and other sources of ignition have been excluded.
Preparation may charge electrostatically: always use earthing leads whentransferring from one container to another.
Operators should wear anti-static footwear and clothing. No sparking tools should be used.
Vapors are heavier than air and may spread along floors.
Vapors may form explosive mixtures with air.

Storage

Requirements for storage areas and containers : Electrical equipment should be protected to the appropriate standard. Floors should be of the conducting type.
Keep container tightly closed. Never use pressure to empty: container isnot a pressure vessel. No smoking. Prevent unauthorized access.
Containers which are opened must be carefully resealed and

kept upright to prevent leakage.

Further information on storage conditions : Always keep in containers of same material as the original one. See also instructions on the label. Avoid heating and direct sunlight.
Keep container dry in a cool, well-ventilated place.
Precautions should be taken to minimise exposure to atmospheric humidityor water: CO2 will be formed which in closed containers can result in pressurisation. DO NOT KEEP THE CONTAINERS SEALED !!

Advice on common storage : Keep away from oxidizing agents and strongly acid or alkaline materials.

Storage temperature : 41 - 95 °F (5 - 35 °C)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Ingredients with workplace control parameters

Ingredients Source	Value	Control parameters
CYCLOHEXANONE CAS-No.108-94-1		
ACGIH	TWA	20 ppm
ACGIH	STEL	50 ppm
OSHA P1	TWA	50 ppm 200 mg/m3
OSHA P0	TWA	25 ppm 100 mg/m3

Immediately Dangerous to Life or Health Concentrations (IDLH)

Substance name	CAS-No.	Control parameters	Update
CYCLOHEXANONE	108-94-1	Immediately Dangerous to Life or Health Concentration Value 700 parts per million	1995-03-01

Engineering measures

Engineering measures : Provide adequate ventilation. Where reasonably practicable this shoud be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and below the OEL (= Occupational Exposure Limit), suitable respiratory protection must be worn.

Personal protective equipment

Protective measures : Persons with a history of asthma, allergies, chronic or recurrent respiratory disease should not be employed in any

process in which this preparation is used.
Do not eat or drink during work - no smoking.
Avoid product contact with skin, eyes and clothing.
Avoid the inhalation of dust from sanding, particulates and spray mist arising from the application of this preparation.

Eye protection : Use safety glasses or face shield (ANSI Z87.1 or approved equivalent).

Hand protection : Glove permeation data does not exist for this material.
The following glove(s) should be used for splash protection only:
Appropriate material: nitrile

Skin and body protection : Personal should wear protective clothing as necessary to prevent skin contact. All parts of the body should be washed after contact.

Respiratory protection : By spraying: air-fed respirator(MHSA/NIOSH approved)

By other operations than spraying: in well ventilated areas, air-fed respirators could be replaced by a combination of charcoal filter and particulate filter mask(it should be MHSA/NIOSH approved).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form : liquid
Color : according product name

Odor : characteristic

Safety data

Flash point : 464 °F (240 °C)
Method: ISO 2719

Ignition temperature : > 752 °F (> 400 °C)

Lower explosion limit : 1 %(V)

Upper explosion limit : 10.0 %(V)

Boiling point/boiling range : ca. 248 °F (120 °C)

Vapor pressure : 100 hPa (75 mmHg)
at 122 °F (50 °C)

Density : 10.0 lb/gal (1.2 g/cm3)

		at 68 °F (20 °C)
Water solubility	:	Note: insoluble
Flow time	:	56 s 4 mm Method: DIN 53211

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	:	Remarks: Stable under recommended storage and handling conditions (See section 7).
Materials to avoid	:	Remarks: Keep away from oxidizing agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions. The product reacts slowly with water resulting in evolution of carbon dioxide. In closed containers, pressure build up could result distortion blowing and in extreme cases bursting of the container.
Hazardous decomposition products	:	Note: In a fire, hazardous decomposition products, such as smoke, carbon monoxide, carbon dioxiode, oxides of nitrogen, hydrogen cyanide, monomers of isocyanates, amines and alcohols may be produced.
Hazardous reactions	:	No dangerous reaction known under conditions of normal use. There are no data available on the preparation itself.

SECTION 11. TOXICOLOGICAL INFORMATION

Further information	:	Exposure of vapor concentration in excess of the stated OEL's may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on kidney, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue muscular weakness, drowsiness and in extrem cases, loss of consciousness. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin. The liquid splashed in the eyes may cause irritation and reversible damage. Based on the properties of the isocyanate components and considering toxicological data on similar preparations: This preparation may cause acute irritation and/or sensitization of the respiratory system leading to an asthmatic condition, wheeziness and a thightness of the chest. Sensitized persons may subsequently show asthmatic symptoms when exposed to atmospheric concentrations well below the OEL. Repeated exposure may lead to permanent respiratory disability.

SECTION 12. ECOLOGICAL INFORMATION

Biodegradability : Remarks:
There are no data available on the preparation itself.

Bioaccumulation : Remarks:
There are no data available on the preparation itself.

Additional ecological information : There are no data available on the preparation itself.

The product should not be allowed to enter drains or water courses.

SECTION 13. DISPOSAL CONSIDERATIONS

Further information : Dispose of in accordance with local regulations.

SECTION 14. TRANSPORT INFORMATION

DOT
Not dangerous goods

IATA
Not dangerous goods

IMDG
Not dangerous goods

Other information : If transported within the user's premises: To be transported always in closed, upright and safe containers. Make sure that persons handling these containers are aware of the rules of conduct in case of incident or spillage.

Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

OSHA Hazards : Toxic by inhalation., Respiratory sensitizer, Skin sensitizer, Moderate skin irritant, Moderate eye irritant, Moderate respiratory irritant, Carcinogen

TSCA Status : y (positive listing)
All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Clean Water Act
The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:
PHOSPHORIC ACID 7664-38-2

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:
PHOSPHORIC ACID 7664-38-2

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO - KNOW

SARA 302 Reportable Quantity : SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Ingredients : DIPHENYLMETHANE-4,4'-DIISOCYANATE, ISOMERES AND HOMOLOGUES 9016-87-9

US CAA HAP This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

CAA112(r) This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

CAA111 This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know Ingredients : CYCLOHEXANONE 108-94-1
PHOSPHORIC ACID 7664-38-2

New Jersey Right To Know Ingredients : DIPHENYLMETHANE-4,4'-DIISOCYANATE, ISOMERES AND HOMOLOGUES 9016-87-9

California Prop. 65 Ingredients : This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

US Federal Regulations

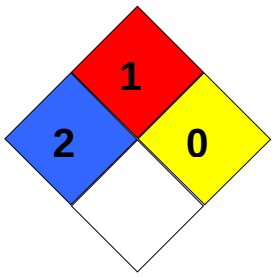
Volatile organic compounds (VOC) content : VOC content excluding water:
0.02 lb/gal (0.00 g/cm3)

SECTION 16. OTHER INFORMATION

Further information

HMIS Classification : Health Hazard: 2
Flammability: 1
Physical hazards: 0

NFPA Classification : Health Hazard: 2
Fire Hazard: 1
Reactivity Hazard: 0



Department issuing safety data sheet

UMCO Umwelt Consult GmbH
Georg-Wilhelm-Str. 183, D-21107 Hamburg
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The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Gurit

Safety Data Sheet
acc. to OSHA HCS

Printing date 05/06/2015 Reviewed on 05/06/2015

*
1 Identification

· **Product identifier**

· **Trade name: Ampreg 21 Fast Hardener**
· **Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
· **Application of the substance / the mixture** Epoxy curing agent

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
.

GURIT (UK) Ltd
St. Cross Business Park
Newport I.O.W.
PO30 5WU
United Kingdom
T:+44(0)1983 828000
F:+44(0)1983 828100

GURIT (Canada) Inc.
175, rue Péladeau
Magog (Québec)
J1X 5G9
Canada
T: +1 819 847 2182
F: +1 819 847 2572

For SDS information or queries contact regulatory@gurit.com

· **Information department:** Regulatory department.
· **Emergency telephone number:** Contact as above

*
2 Hazard(s) identification

· **Classification of the substance or mixture**
· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

C; Corrosive

R34: Causes burns.

Xn; Harmful

R21/22: Harmful in contact with skin and if swallowed.

Xi; Irritant

R43: May cause sensitization by skin contact.

R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.
The product has been marked in accordance with national laws.
Observe the general safety regulations when handling chemicals.

· **Code letter and hazard designation of product:**
C Corrosive

· **Hazard-determining components of labeling:**
2-piperazin-1-ylethylamine
3,6-diazaoctanethylenediamin

· **Risk phrases:**
21/22 Harmful in contact with skin and if swallowed.
34 Causes burns.

(Contd. on page 2)

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Trade name: Ampreg 21 Fast Hardener

(Contd. of page 1)

43 May cause sensitization by skin contact.
52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

· **Safety phrases:**
20 When using do not eat or drink.
23 Do not breathe vapour.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
45 In case of accident or if you feel unwell, seek medical advice immediately.
61 Avoid release to the environment. Refer to special instructions/Safety data sheets
· **Hazard description:**
· **WHMIS classification**
B3 - Combustible liquid
D2B - Toxic material causing other toxic effects
E - Corrosive material

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 3
Fire = 2
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 3
Fire = 2
Reactivity = 0

· **Other hazards**
The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

*
3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**		
140-31-8	2-piperazin-1-ylethylamine	10-30%
112-24-3	3,6-diazaoctanethylenediamin	1-5%
98-54-4	4-tert-butylphenol	1-5%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

*
4 First-aid measures

· **Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

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Trade name: Ampreg 21 Fast Hardener

(Contd. of page 2)

· **After inhalation:**
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:**
A person vomiting while lying on their back should be turned onto their side.
Do not induce vomiting; immediately call for medical help.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed**
No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

*
5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
Water haze
Foam
Fire-extinguishing powder
Carbon dioxide
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture**
Formation of toxic gases is possible during heating or in case of fire.
· **Advice for firefighters**
· **Protective equipment:**
Wear fully protective suit.
Wear self-contained respiratory protective device.
· **Additional information**
Collect contaminated fire fighting water separately. It must not enter the sewage system.

*
6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

*
7 Handling and storage

· **Handling:**
· **Precautions for safe handling** Ensure good ventilation/exhaustion at the workplace.
· **Information about protection against explosions and fires:** No special measures required.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.

(Contd. on page 4)

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Trade name: Ampreg 21 Fast Hardener

(Contd. of page 3)

· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Protect from heat and direct sunlight.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
112-24-3 3,6-diazaoctanethylenediamin (2.5-10%)	
EV	3 mg/m³, 0.5 ppm Skin

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Do not inhale gases / fumes / aerosols.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
Filter P2
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
Use suitable respiratory protective device in case of insufficient ventilation.
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **For the permanent contact of a maximum of 15 minutes gloves made of the following materials are suitable:**
Nitrile rubber, NBR
· **As protection from splashes gloves made of the following materials are suitable:**
Nitrile rubber, NBR
· **Eye protection:**

Tightly sealed goggles

(Contd. on page 5)

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Trade name: Ampreg 21 Fast Hardener

(Contd. of page 4)

· **Body protection:** Protective work clothing

*
9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Solid material
Color:	Light brown
· **Odor:**	Amine-like
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	220 °C
· **Flash point:**	88 °C
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	315 °C
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	2.1 Vol %
Upper:	10.5 Vol %
· **Vapor pressure at 20 °C:**	0.1 hPa
· **Density:**	Not determined.
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 20 °C:	1222 mPas
Kinematic:	Not determined.
· **Solvent content:**	
Organic solvents:	0.0 %
Water:	0.0 %
Solids content:	70.7 %
· **Other information**	No further relevant information available.

*
10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.

(Contd. on page 6)

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Trade name: Ampreg 21 Fast Hardener

(Contd. of page 5)

· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** Danger of toxic pyrolysis products.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
140-31-8 2-piperazin-1-ylethylamine		
Oral	LD50	1470 mg/kg (rat)
Dermal	LD50	866 mg/kg (rbt)

· **Primary irritant effect:**
· **on the skin:** Caustic effect on skin and mucous membranes.
· **on the eye:** Strong caustic effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Corrosive
Irritant
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
None of the ingredients is listed.

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

*
12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Ecotoxical effects:**
· **Remark:** Harmful to fish
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
Danger to drinking water if even small quantities leak into the ground.
Harmful to aquatic organisms
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

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Trade name: Ampreg 21 Fast Hardener

(Contd. of page 6)

· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:**
Packagings that cannot be cleansed are to be disposed of in the same manner as the product.

*

14 Transport information

· **UN-Number**	
· **DOT, TDG, IMDG, IATA**	UN2735
· **UN proper shipping name**	
· **DOT**	Polyamines, liquid, corrosive, n.o.s. (N-Aminoethylpiperazine, Triethylenetetramine)
· **TDG**	2735 Polyamines, liquid, corrosive, n.o.s. (N-Aminoethylpiperazine, Triethylenetetramine)
· **IMDG, IATA**	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (N-AMINOETHYLPIPERAZINE, TRIETHYLENETETRAMINE)
· **Transport hazard class(es)**	
· **DOT**	

· **Class**	8 Corrosive substances
· **Label**	8
· **TDG, IMDG, IATA**	

· **Class**	8 Corrosive substances
· **Label**	8
· **Packing group**	
· **DOT, TDG, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special precautions for user**	Warning: Corrosive substances
· **Danger code (Kemler):**	80
· **EMS Number:**	F-A,S-B
· **Segregation groups**	Alkalis
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

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Trade name: Ampreg 21 Fast Hardener

(Contd. of page 7)

· **UN "Model Regulation":** UN2735, Polyamines, liquid, corrosive, n.o.s. (N-Aminoethylpiperazine, Triethylenetetramine), 8, III

*
15 Regulatory information

· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredient is listed.

· **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **MAK (German Maximum Workplace Concentration)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **National regulations:**

· **Water hazard class:** Water hazard class 2 (Self-assessment): hazardous for water.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Classification of the substance or mixture**

GHS05 Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.

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Trade name: Ampreg 21 Fast Hardener

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GHS07

Skin Sens. 1 H317 May cause an allergic skin reaction.

· **Department issuing MSDS:** Regulatory Affairs Department. regulatory@gurit.com
· **Contact:** regulatory@gurit.com
· **Date of preparation / last revision** 05/06/2015 / 12
· **Abbreviations and acronyms:**
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
· ***** Data compared to the previous version altered.**

SAFETY DATA SHEET

ARALDITE® 2010-1 A US

Section 1. Identification

GHS product identifier : **ARALDITE® 2010-1 A US**

Product code : 00067945

Other means of identification : Not available.

Product type : Liquid.

Material uses : Resin for adhesive systems

Supplier's details : Huntsman Advanced Materials Americas LLC
P.O. Box 4980
The Woodlands, TX 77387

Non-Emergency phone: (800) 257-5547

e-mail address of person responsible for this SDS : MSDS@huntsman.com

Emergency telephone number (24h/7day) : Chemtrec: (800) 424-9300 or (703) 527-3887

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
SKIN SENSITIZATION - Category 1
AQUATIC HAZARD (LONG-TERM) - Category 2

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Causes serious eye irritation.
Causes skin irritation.
May cause an allergic skin reaction.
Toxic to aquatic life with long lasting effects.

Precautionary statements : Wear protective gloves: > 8 hours (breakthrough time): butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL), nitrile rubber, neoprene, Polyvinyl Chloride (PVC). Wear eye or face protection. Avoid release to the environment. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Collect spillage. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Section 2. Hazards identification

Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards which do not result in classification : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
Bisphenol A epoxy resin	60 - 100	25068-38-6
Bisphenol F epoxy resin	3 - 7	9003-36-5
Bisphenol A epoxy resin	3 - 7	25085-99-8
terphenyl	0.1 - 1	26140-60-3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Section 4. First aid measures

Inhalation : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Ingestion : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : No specific treatment. Treat symptomatically. Call medical doctor or poison control center immediately if large quantities have been ingested.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Flash point : Closed cup: >149°C (>300.2°F) [PMCC]

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
halogenated compounds

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters :

Section 5. Fire-fighting measures

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

Methods and materials for containment and cleaning up : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities :

Section 7. Handling and storage

Store between the following temperatures: 2 to 40°C (35.6 to 104°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Appropriate engineering controls : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time): butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL), nitrile rubber, neoprene, Polyvinyl Chloride (PVC)

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Thermal hazards : Not available.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Paste.]

Color : Cream

Odor : Slight

Odor threshold : Not available.

pH : 7 [Conc. (% w/w): 50%]

Melting point/Freezing point : Not available.

Boiling/condensation point : Not available.

Flash point : Closed cup: >149°C (>300.2°F) [PMCC]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 1.17

Solubility in water : practically insoluble

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Density : 1.17 g/cm³ [25°C (77°F)]

Viscosity : Dynamic (room temperature): >100000 mPa·s (>100000 cP)

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Test	Endpoint	Species	Result
Bisphenol A epoxy resin	-	LC0 Inhalation Vapor	Rat - Male	0.00001 ppm
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rat - Male, Female	>2000 mg/kg
	OECD 420 Acute Oral Toxicity - Fixed Dose Method	LD50 Oral	Rat - Female	>2000 mg/kg
Bisphenol F epoxy resin	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rat - Male, Female	>2000 mg/kg
	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male, Female	>5000 mg/kg
ARALDITE 2010-1 A US	-	LD50 Oral	Rat	>5000 mg/kg

Irritation/Corrosion

Product/ingredient name	Test	Species	Result
Bisphenol A epoxy resin	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Mild irritant
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes - Mild irritant
Bisphenol F epoxy resin	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes - Non-irritant.
	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Mild irritant

Conclusion/Summary

Skin :

Bisphenol A epoxy resin	Irritating to skin.
Bisphenol F epoxy resin	Slightly irritating to the skin.
Bisphenol A epoxy resin	No additional information.
terphenyl	No additional information.

Eyes :

Bisphenol A epoxy resin	Irritating to eyes.
Bisphenol F epoxy resin	Non-irritating to the eyes.
Bisphenol A epoxy resin	No additional information.
terphenyl	No additional information.

Respiratory :

Bisphenol A epoxy resin	No additional information.
Bisphenol F epoxy resin	No additional information.
Bisphenol A epoxy resin	No additional information.
terphenyl	No additional information.

Sensitization

Product/ingredient name	Test	Route of exposure	Species	Result
Bisphenol A epoxy resin	-	skin	Mouse	Sensitizing
Bisphenol F epoxy resin	-	skin	Mouse	Sensitizing
ARALDITE 2010-1 A US	-	skin	Guinea pig	Sensitizing

Mutagenicity

Section 11. Toxicological information

Product/ingredient name	Test	Result
Bisphenol A epoxy resin	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Positive
	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic Metabolic activation: +/-	Positive
	Experiment: In vivo Subject: Mammalian-Animal Cell: Germ	Negative
	Experiment: In vivo Subject: Mammalian-Animal Cell: Somatic	Negative
Bisphenol F epoxy resin	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Positive
	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic Metabolic activation: +/-	Positive
	Experiment: In vitro Subject: Mammalian-Human Cell: Somatic Metabolic activation: +/-	Positive
	Experiment: In vivo Subject: Mammalian-Animal Cell: Somatic	Negative
	Experiment: In vivo Subject: Mammalian-Animal Cell: Somatic	Negative

Carcinogenicity

Product/ingredient name	Test	Species	Dose	Exposure	Result/Result type
Bisphenol A epoxy resin	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Male, Female	15 mg/kg	2 years; 7 days per week	Negative - Oral - NOAEL
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat - Female	1 mg/kg	2 years; 5 days per week	Negative - Dermal - NOEL
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Mouse - Male	0.1 mg/kg	2 years; 3 days per week	Negative - Dermal - NOEL

Reproductive toxicity

Section 11. Toxicological information

Product/ingredient name	Test	Species	Maternal toxicity	Fertility	Developmental effects
Bisphenol A epoxy resin	OECD 416 Two-Generation Reproduction Toxicity Study	Rat - Male, Female	Negative	Negative	Negative
Bisphenol F epoxy resin	OECD 416 Two-Generation Reproduction Toxicity Study	Rat - Male, Female	Negative	Negative	Negative

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
Bisphenol A epoxy resin	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	Negative - Oral
	EPA CFR	Rabbit - Female	Negative - Dermal
	OECD 414 Prenatal Developmental Toxicity Study	Rabbit - Female	Negative - Oral
Bisphenol F epoxy resin	EPA CFR	Rabbit - Female	Negative - Dermal

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Ingestion : Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Section 11. Toxicological information

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Test	Endpoint	Species	Result
Bisphenol A epoxy resin	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral	Rat - Male, Female	50 mg/kg
	OECD 411 Subchronic Dermal Toxicity: 90-day Study	Sub-chronic NOEL Dermal	Rat - Male, Female	10 mg/kg
	OECD 411 Subchronic Dermal Toxicity: 90-day Study	Sub-chronic NOAEL Dermal	Mouse - Male	100 mg/kg
Bisphenol F epoxy resin	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral	Rat - Male, Female	250 mg/kg

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Other information : Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Test	Endpoint		Exposure	Species	Result	
Bisphenol A epoxy resin	EPA CFR	Acute	EC50	72 hours Static	Algae	9.4	mg/l
	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute	EC50	48 hours Static	Daphnia	1.7	mg/l
	Unknown guidelines	Acute	IC50	3 hours Static	Bacteria	>100	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	1.5	mg/l
	OECD 211 *Daphnia Magna* Reproduction Test	Chronic	NOEC	21 days Semi-static	Daphnia	0.3	mg/l
Bisphenol F epoxy resin	OECD 201 Alga, Growth Inhibition Test	Acute	EC50	72 hours Static	Algae	1.8	mg/l
	OECD 202: Part I (Daphnia sp., Acute Immobilisation test)	Acute	EC50	48 hours Static	Daphnia	1.6	mg/l
	-	Acute	IC50	3 hours Static	Bacteria	>100	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Semi-static	Fish	0.55	mg/l
	OECD 211 *Daphnia Magna* Reproduction Test	Chronic	NOEC	21 days Semi-static	Daphnia	0.3	mg/l

Persistence and degradability

Product/ingredient name	Test	Period	Result
Bisphenol A epoxy resin	OECD Derived from OECD 301F (Biodegradation Test)	28 days	5 %
Bisphenol F epoxy resin	EU	28 days	0 %

Conclusion/Summary : Bisphenol A epoxy resin Not readily biodegradable.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Bisphenol A epoxy resin	Fresh water 4.83 days Fresh water 3.58 days Fresh water 7.1 days	-	Not readily
Bisphenol F epoxy resin	-	-	Not readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Bisphenol A epoxy resin	3.242	31	low
Bisphenol F epoxy resin	2.7 to 3.6	-	low

Mobility in soil

Not available.

Other adverse effects : No known significant effects or critical hazards.

Other ecological information

Section 12. Ecological information

BOD5 : Not determined.

COD : Not determined.

TOC : Not determined.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14. Transport information

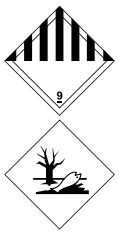
Proper shipping name

DOT : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A/F EPOXY RESIN). Marine pollutant (Bisphenol A epoxy resin, Bisphenol F epoxy resin)

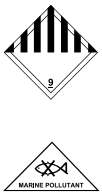
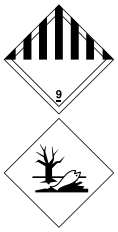
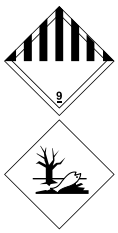
TDG : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A/F EPOXY RESIN). Marine pollutant (Bisphenol A epoxy resin, Bisphenol F epoxy resin)

IMDG : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A/F EPOXY RESIN). Marine pollutant (Bisphenol A epoxy resin, Bisphenol A epoxy resin)

IATA : Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A/F EPOXY RESIN)

Regulatory information	UN number	Classes	PG*	Label	Additional information
DOT Classification	UN3082	9	III		Non-bulk packages of this product are not regulated as hazardous materials unless transported by inland waterway. The marine pollutant mark is not required when transported on inland waterways in sizes of ≤5 L or ≤5 kg.

Section 14. Transport information

TDG Classification	UN3082	9	III		The product is not regulated as a dangerous good when transported by road or rail.
IMDG Classification	UN3082	9	III		The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg. **Emergency schedules (EmS)** F-A S-F
IATA Classification	UN3082	9	III		The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg. **Passenger and Cargo Aircraft** Quantity limitation: 450 L Packaging instructions: 964 **Cargo Aircraft Only** Quantity limitation: 450 L Packaging instructions: 964

PG* : Packing group

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product

United States Regulations

TSCA 8(b) inventory : All components are listed or exempted.

TSCA 5(a)2 final significant new use rule (SNUR) : No ingredients listed.

TSCA 5(e) substance consent order : No ingredients listed.

TSCA 12(b) export notification : No ingredients listed.

SARA 311/312 : Immediate (acute) health hazard

Clean Air Act - Ozone Depleting Substances (ODS) : This product does not contain nor is it manufactured with ozone depleting substances.

Section 15. Regulatory information

SARA 313 : No ingredients listed.

CERCLA Hazardous substances : No ingredients listed.

State regulations

PENNSYLVANIA - RTK : Terphenyl, hydrogenated

California Prop 65 : This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Canadian regulations

CEPA DSL : All components are listed or exempted.

WHMIS Classes : Class D-2B: Material causing other toxic effects (Toxic).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

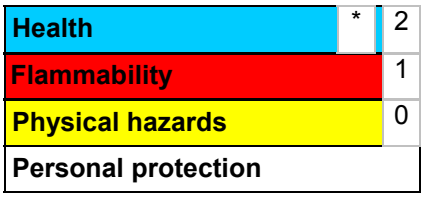
Brazil Regulations

Classification system used : **Norma ABNT-NBR 14725-2:2012**

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: At least one component is not listed.
Korea inventory: All components are listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.
Taiwan inventory (CSNN): Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.) :

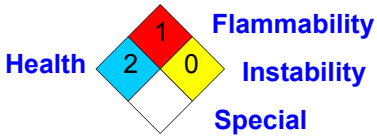


The customer is responsible for determining the PPE code for this material.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

Section 16. Other information

National Fire Protection Association (U.S.A.) :



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Further information :

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Indicates information that has changed from previously issued version.

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SAFETY DATA SHEET

ARALDITE® 2010-1 B US

Section 1. Identification

GHS product identifier : **ARALDITE® 2010-1 B US**

Product code : 00073215

Other means of identification : Not available.

Product type : Liquid.

Material uses : Hardener for adhesive systems

Supplier's details : Huntsman Advanced Materials Americas LLC
P.O. Box 4980
The Woodlands, TX 77387

Non-Emergency phone: (800) 257-5547

e-mail address of person responsible for this SDS : MSDS@huntsman.com

Emergency telephone number (24h/7day) : Chemtrec: (800) 424-9300 or (703) 527-3887

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : ACUTE TOXICITY (oral) - Category 4
SKIN CORROSION/IRRITATION - Category 1C
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
SKIN SENSITIZATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
AQUATIC HAZARD (ACUTE) - Category 3
AQUATIC HAZARD (LONG-TERM) - Category 3

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 72.3%

Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 72.3%

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Harmful if swallowed.
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May cause damage to organs through prolonged or repeated exposure.
Harmful to aquatic life with long lasting effects.

Section 2. Hazards identification

Precautionary statements : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Avoid release to the environment. Do not breathe vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Get medical attention if you feel unwell. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician. Store locked up. Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazards which do not result in classification : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
triethylene glycol dimercaptan	3 - 7	14970-87-7
2,4,6-tris(dimethylaminomethyl)phenol	3 - 7	90-72-2
Dimethyldipropyltriamine	1 - 3	10563-29-8
Terphenyl	0.1 - 1	26140-60-3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Section 4. First aid measures

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : Harmful if swallowed. May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : No specific treatment. Treat symptomatically. Call medical doctor or poison control center immediately if large quantities have been ingested.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Flash point : Closed cup: 100°C (212°F) [ASTM D 93 (Pensky-Martens Closed Cup)]

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
sulfur oxides
halogenated compounds

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 6. Accidental release measures

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Thermal hazards : Not available.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid. [Paste.]

Color : Pale yellow.

Odor : Mercaptan

Odor threshold : Not available.

pH : Not available.

Melting point/Freezing point : Not available.

Boiling/condensation point : Not available.

Flash point : Closed cup: 100°C (212°F) [ASTM D 93 (Pensky-Martens Closed Cup)]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 1.14

Solubility in water : very slightly soluble

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Viscosity : Not available.

VOC : 3.6 % (w/w)

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Test	Endpoint	Species	Result
2,4,6-tris (dimethylaminomethyl) phenol	Unknown guidelines	LD50 Dermal	Rat - Male	>971 mg/kg
	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male, Female	2169 mg/kg
Dimethyldipropyltriamine	Unknown guidelines	LD50 Dermal	Rabbit	1310 mg/kg
	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male, Female	1669 mg/kg

Irritation/Corrosion

Product/ingredient name	Test	Species	Result
2,4,6-tris(dimethylaminomethyl) phenol	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Corrosive
	EPA CFR	Rabbit	Eyes - Corrosive
Dimethyldipropyltriamine	OECD 404 Acute Dermal Irritation/Corrosion	Rabbit	Skin - Corrosive

Conclusion/Summary

Skin :

triethylene glycol dimercaptan	No additional information.
2,4,6-tris (dimethylaminomethyl) phenol	Corrosive to the skin.
Dimethyldipropyltriamine	Corrosive to the skin.
Terphenyl	No additional information.

Eyes :

Section 11. Toxicological information

	triethylene glycol dimercaptan	No additional information.
	2,4,6-tris (dimethylaminomethyl) phenol	Corrosive to eyes.
	Dimethyldipropyltriamine	Corrosive to eyes.
	Terphenyl	No additional information.
Respiratory :	triethylene glycol dimercaptan	No additional information.
	2,4,6-tris (dimethylaminomethyl) phenol	No additional information.
	Dimethyldipropyltriamine	No additional information.
	Terphenyl	No additional information.

Sensitization

Product/ingredient name	Test	Route of exposure	Species	Result
2,4,6-tris (dimethylaminomethyl) phenol	-	skin	Guinea pig	Not sensitizing
Dimethyldipropyltriamine	-	skin	Guinea pig	Sensitizing

Mutagenicity

Product/ingredient name	Test	Result
2,4,6-tris (dimethylaminomethyl)phenol	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vitro Subject: Mammalian-Animal Cell: Somatic Metabolic activation: +/-	Negative
	Experiment: In vitro Subject: Mammalian-Human Cell: Somatic Metabolic activation: +/-	Negative
Dimethyldipropyltriamine	Experiment: In vitro Subject: Bacteria Metabolic activation: +/-	Negative
	Experiment: In vitro Subject: Mammalian-Animal Metabolic activation: +/-	Negative
	Experiment: In vitro Subject: Mammalian-Human Metabolic activation: +/-	Negative

Conclusion/Summary :

2,4,6-tris (dimethylaminomethyl) phenol	Not mutagenic in a standard battery of genetic toxicological tests.
Dimethyldipropyltriamine	Not mutagenic in a standard battery of genetic toxicological tests.

Carcinogenicity

Section 11. Toxicological information

Product/ingredient name	Test	Species	Dose	Exposure	Result/Result type
Dimethyldipropyltriamine	No official guidelines	Mouse - Male	-	20 months; 3 days per week	Negative - Dermal - NOAEL

Reproductive toxicity

Product/ingredient name	Test	Species	Maternal toxicity	Fertility	Developmental effects
2,4,6-tris (dimethylaminomethyl) phenol	OECD 422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat - Male, Female	Negative	Negative	Negative

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
Dimethyldipropyltriamine	OECD 422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Rat - Male, Female	Positive - Oral

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
2,4,6-tris(dimethylaminomethyl)phenol	Category 2	Not determined	brain

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : Harmful if swallowed. May cause burns to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Section 11. Toxicological information

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Test	Endpoint	Species	Result
2,4,6-tris (dimethylaminomethyl) phenol	OECD 422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Sub-acute NOEL Oral	Rat - Male, Female	15 mg/kg
Dimethyldipropyltriamine	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral	Rat - Male, Female	1000 ppm
	No official guidelines	Chronic NOAEL Dermal	Mouse - Male	>56.3 mg/kg/d
	No official guidelines	Sub-acute NOEC Inhalation Vapor	Rat - Male, Female	550 mg/m³

General : May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Section 11. Toxicological information

Route	ATE value
Oral Dermal Inhalation (vapors)	1932.6 mg/kg 13630.6 mg/kg 57.26 mg/l

Other information : Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Test	Endpoint		Exposure	Species	Result	
2,4,6-tris (dimethylaminomethyl)phenol	OECD 201 Alga, Growth Inhibition Test	Acute	ErC50 (growth rate)	72 hours Static	Algae	84	mg/l
	Unknown guidelines	Acute	LC50	96 hours Static	Daphnia	718	mg/l
	-	Acute	LC50	96 hours Static	Fish	175	mg/l
	-	Chronic	NOEC	72 hours	Algae	6.25	mg/l
Dimethyldipropyltriamine	DIN DIN 38412 Part 8	Acute	EC50	16 hours Static	Bacteria	181	mg/l
	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute	EC50	48 hours Static	Daphnia	9.2	mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute	ErC50 (growth rate)	72 hours Static	Algae	21	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	>100	mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	LOAEL	72 hours Static	Algae	5.7	mg/l

Persistence and degradability

Product/ingredient name	Test	Period	Result
2,4,6-tris (dimethylaminomethyl)phenol	OECD 301D Ready Biodegradability - Closed Bottle Test	28 days	4 %
Dimethyldipropyltriamine	ISO ISO 7827, 1984 - Evaluation in an aqueous medoum of the ultimate aerobic biodegradability of organic compounds	28 days	100 %

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
2,4,6-tris (dimethylaminomethyl)phenol	-	-	Not readily
Dimethyldipropyltriamine	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
2,4,6-tris (dimethylaminomethyl)phenol	0.219	-	low
Dimethyldipropyltriamine	0.5	-	low

Section 12. Ecological information

Mobility in soil

Not available.

Other adverse effects : No known significant effects or critical hazards.

Other ecological information

BOD5 : Not determined.

COD : Not determined.

TOC : Not determined.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Section 14. Transport information

Proper shipping name

DOT : Polyamines, liquid, corrosive, n.o.s. (2,4,6-Tris(dimethylaminomethyl)phenol , Dimethyl dipropyl triamine)

TDG : Polyamines, liquid, corrosive, n.o.s. (2,4,6-Tris(dimethylaminomethyl)phenol , Dimethyl dipropyl triamine)

IMDG : Polyamines, liquid, corrosive, n.o.s. (2,4,6-Tris(dimethylaminomethyl)phenol , Dimethyl dipropyl triamine)

IATA : Polyamines, liquid, corrosive, n.o.s. (2,4,6-Tris(dimethylaminomethyl)phenol , Dimethyl dipropyl triamine)

Regulatory information	UN number	Classes	PG*	Label	Additional information
DOT Classification	UN2735	8	III		-
TDG Classification	UN2735	8	III		-

Section 14. Transport information

IMDG Classification	UN2735	8	III		**Emergency schedules (EmS)** F-A S-B
IATA Classification	UN2735	8	III		**Passenger and Cargo Aircraft** Quantity limitation: 5 L Packaging instructions: 852 **Cargo Aircraft Only** Quantity limitation: 60 L Packaging instructions: 856

PG* : Packing group

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product

United States Regulations

TSCA 8(b) inventory : All components are listed or exempted.

TSCA 5(a)2 final significant new use rule (SNUR) : No ingredients listed.

TSCA 5(e) substance consent order : No ingredients listed.

TSCA 12(b) export notification : No ingredients listed.

SARA 311/312 : Immediate (acute) health hazard
Delayed (chronic) health hazard

Clean Air Act - Ozone Depleting Substances (ODS) : This product does not contain nor is it manufactured with ozone depleting substances.

SARA 313 : No ingredients listed.

CERCLA Hazardous substances : No ingredients listed.

State regulations

PENNSYLVANIA - RTK : Terphenyl, hydrogenated

California Prop 65 : This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Canadian regulations

CEPA DSL : At least one component is not listed.

Section 15. Regulatory information

WHMIS Classes : Class E: Corrosive material

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

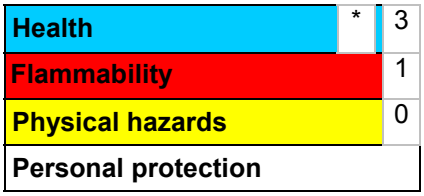
Brazil Regulations

Classification system used : **Norma ABNT-NBR 14725-2:2012**

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: At least one component is not listed.
Korea inventory: All components are listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): At least one component is not listed.
Philippines inventory (PICCS): At least one component is not listed.
Taiwan inventory (CSNN): Not determined.

Section 16. Other information

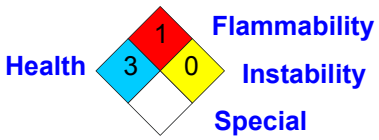
Hazardous Material Information System (U.S.A.) :



The customer is responsible for determining the PPE code for this material.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

National Fire Protection Association (U.S.A.) :



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Further information :

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Section 16. Other information

Version : 5

Indicates information that has changed from previously issued version.

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Material Safety Data Sheet

HUNTSMAN
Enriching lives through innovation

ARALDITE® 2021 B US

1 . Product and company identification

Product name : **ARALDITE® 2021 B US**
Material uses : Acrylate activator
MSDS # : 00048083
Validation date : 8/4/2012.
Print date : 8/4/2012.

Supplier/Manufacturer : Huntsman Advanced Materials Americas LLC
P.O. Box 4980
The Woodlands, TX 77387

Non-Emergency phone: (800) 257-5547

E-Mail: MSDS@huntsman.com

In case of emergency : Chemtrec: (800) 424-9300 or (703) 527-3887

2 . Hazards identification

Physical state : Liquid. [Viscous liquid.]
Odor : Pungent.
Color : Yellow.

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : WARNING!

FLAMMABLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Flammable liquid. Keep away from heat, sparks and flame. Do not breathe vapor or mist. Do not get on skin or clothing. Avoid contact with eyes. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

See toxicological information (Section 11)

GENERAL INFORMATION : Read the entire MSDS for a more thorough evaluation of the hazards.

3 . Composition/information on ingredients

Name	CAS number	%
Methyl methacrylate	80-62-6	60 - 100
3,5-diethyl-1,2-dihydro-1-phenyl-2-propylpyridine	34562-31-7	1 - 3

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4 . First aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Notes to physician : No specific treatment. Treat symptomatically. Call medical doctor or poison control center immediately if large quantities have been ingested.

5 . Fire-fighting measures

Flash point : Closed cup: 10.6°C (51.1°F) [DIN 51758 EN 22719 (Pensky-Martens Closed Cup)]

Flammable limits : Lower: 2%
Upper: 12.5%

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

Extinguishing media

Suitable : Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the

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6 . Accidental release measures

same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store between the following temperatures: 2 to 8°C (35.6 to 46.4°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
methyl methacrylate	**ACGIH TLV (United States, 2/2010). Skin sensitizer.** TWA: 50 ppm 8 hour(s). STEL: 100 ppm 15 minute(s). **OSHA PEL (United States, 6/2010).** TWA: 100 ppm 8 hour(s). TWA: 410 mg/m³ 8 hour(s).

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

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8 . Exposure controls/personal protection

Respiratory	: In case of inadequate ventilation wear respiratory protection. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Hands	: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. >8 hours (breakthrough time): butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL)
Eyes	: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Skin	: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Environmental exposure controls	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

General information

Appearance

Physical state	: Liquid. [Viscous liquid.]
Color	: Yellow.
Odor	: Pungent.

Important health, safety and environmental information

pH	: 8.5
Boiling/condensation point	: 101°C (213.8°F)
Melting/freezing point	: Not available.
Flash point	: Closed cup: 10.6°C (51.1°F) [DIN 51758 EN 22719 (Pensky-Martens Closed Cup)]
Flammable limits	: Lower: 2% Upper: 12.5%
Auto-ignition temperature	: Not available.
Decomposition temperature	: >200°C (>392°F)
Vapor pressure	: 3.7 kPa (27.75 mm Hg) [20°C]
Specific gravity	: Not available.
Water solubility	: Insoluble
Partition coefficient: n-octanol/water (log Kow)	: Not available.
Viscosity	: Dynamic: 40000 mPa·s (40000 cP)
Density	: 0.96 g/cm³ [25°C (77°F)]
Vapor density	: Not available.
Evaporation rate (butyl acetate = 1)	: Not available.
VOC	: Not available.

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10 . Stability and reactivity

Chemical stability : The product is stable.
Under normal conditions of storage and use, hazardous reactions will not occur.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Materials to avoid : strong acids, strong bases, strong oxidising agents

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

Potential acute health effects

Inhalation : Irritating to respiratory system. May cause sensitization by inhalation.

Ingestion : No known significant effects or critical hazards.

Skin : Irritating to skin. May cause sensitization by skin contact.

Eyes : Irritating to eyes.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
methyl methacrylate	LD50 Oral	Rat	7872 mg/kg	-

Sensitizer

Product/ingredient name	Route of exposure	Species	Result
methyl methacrylate	-	-	-

Carcinogenic class

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
methyl methacrylate	A4	3	-	-	-	-

Potential chronic health effects

Chronic effects : Contains material that can cause target organ damage. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Target organs : Contains material which causes damage to the following organs: kidneys, liver.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure

Pre-existing respiratory and skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

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12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Biodegradability

Other ecological information

Biological Oxygen Demand (BOD 5 DAY) : Not Determined

Chemical Oxygen Demand (COD) : Not Determined

Other adverse effects : No known significant effects or critical hazards.

PBT : Not applicable.

Other information

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

14 . Transport information

Proper shipping name

DOT : ADHESIVES

TDG : ADHESIVES

IMDG : ADHESIVES

IATA : ADHESIVES

Regulatory information	UN number	Classes	PG*	Label	Additional information
DOT Classification	UN1133	3	II		-
TDG Classification	UN1133	3	II		-

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14 . Transport information

IMDG Class	UN1133	3	II		**Emergency schedules (EmS)** F-E, S-D
IATA-DGR Class	UN1133	3	II		**Passenger and Cargo Aircraft** Quantity limitation: 5 L Packaging instructions: 353 **Cargo Aircraft Only** Quantity limitation: 60 L Packaging instructions: 364

PG* : Packing group

15 . Regulatory information

U.S. Federal regulations

HCS Classification : Flammable liquid
Irritating material
Sensitizing material
Target organ effects

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.

TSCA 5(a)2 final significant new use rule (SNUR) : None.

TSCA 5(e) substance consent order : None.

TSCA 12(b) export notification : None.

TSCA 12(b) annual export notification : None.

SARA 302/304/311/312 extremely hazardous substances : **SARA 302/304/311/312 extremely hazardous substances**: No Ingredient Listed

SARA 311/312 hazard identification : **SARA 311/312 MSDS distribution - chemical inventory - hazard identification:** Fire hazard, reactive, Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Air Act Section 111 - Volatile Organic Compounds (VOC) Not available.

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) :

Product name	CAS number	Concentration
methyl methacrylate	80-62-6	60 - 100

Clean Air Act - Ozone Depleting Substances (ODS) : This product does not contain nor is it manufactured with ozone depleting substances.

SARA 313 No ingredients listed.

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15 . Regulatory information

CERCLA Hazardous substances : No ingredients listed.

STATE REGULATIONS:

PENNSYLVANIA - RTK: None

California Prop 65 : This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Canada

WHMIS (Canada) : Class B-2: Flammable liquid
Class D-2B: Material causing other toxic effects (Toxic).

CEPA DSL : All components are listed or exempted.

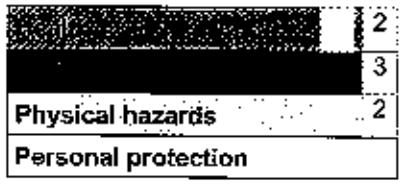
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International lists : **Australia inventory (AICS):** All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: At least one component is not listed.
Korea inventory: At least one component is not listed.
New Zealand Inventory of Chemicals (NZIoC): At least one component is not listed.
Philippines inventory (PICCS): All components are listed or exempted.

16 . Other information

Label requirements : FLAMMABLE LIQUID AND VAPOR. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.

Hazardous Material Information System (U.S.A.) :



The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :

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Date of issue : 8/4/2012.

Date of previous issue : 6/29/2012.

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16 . Other information

Version : 3

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SAFETY DATA SHEET

ARALDITE® AV 4076-1

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1 Product identifier

Product name : ARALDITE® AV 4076-1

Registration number : Not available.

Product code : 00051026

Product description :

Other means of identification : Not available.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Product use : Resin for adhesive systems

1.3 Details of the supplier of the safety data sheet

Supplier : Huntsman Advanced Materials (Europe)BVBA
Everslaan 45
3078 Everberg / Belgium
Tel.: +41 61 299 20 41
Fax: +41 61 299 20 40

e-mail address of person responsible for this SDS : Global_Product_EHS_AdMat@huntsman.com

E-mail address to request full REACH registration number upon EU member State Authority request :
REACH_Registration_Nr_AM@huntsman.com

1.4 Emergency telephone number

Supplier

Telephone number : EUROPE: +32 35 75 1234
France ORFILA: +33(0)145425959
ASIA: +65 6336-6011
China: +86 20 39377888
India: +91 22 4050 6333
Australia: 1800 786 152
New Zealand: 0800 767 437
USA: +1/800/424.9300

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Skin Irrit. 2, H315
Eye Irrit. 2, H319
Skin Sens. 1, H317
Aquatic Chronic 2, H411

Ingredients of unknown toxicity :

Ingredients of unknown ecotoxicity :

Classification according to Directive 1999/45/EC [DPD]

SECTION 2: Hazards identification

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : Xi; R36/38
R43
N; R51/53

Human health hazards : Irritating to eyes and skin. May cause sensitisation by skin contact.

Environmental hazards : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Causes serious eye irritation.
Causes skin irritation.
May cause an allergic skin reaction.
Toxic to aquatic life with long lasting effects.

Precautionary statements

General : Not applicable.

Prevention : Wear protective gloves: > 8 hours (breakthrough time): Ethyl Vinyl Alcohol Laminate (EVAL), butyl rubber. Wear eye or face protection. Avoid release to the environment.

Response : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage : Not applicable.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)

Supplemental label elements : Not applicable.

Supplemental label elements : Contains epoxy constituents. See information supplied by the manufacturer.

Special packaging requirements

Containers to be fitted with child-resistant fastenings : Not applicable.

Tactile warning of danger : Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification 67/548/EEC	Classification Regulation (EC) No. 1272/2008 [CLP]	Type
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	CAS: 25068-38-6 EC: 500-033-5 RRN: 01-2119456619-26	60-100	Xi; R36/38 R43 N; R51/53 **See Section 16 for the full text of the R-phrases declared above.**	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 Aquatic Chronic 2, H411 **See Section 16 for the full text of the H statements declared above.**	[1]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
[5] Substance of equivalent concern

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such

SECTION 4: First aid measures

as a collar, tie, belt or waistband.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Ingestion : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : Symptomatic treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds

5.3 Advice for firefighters

SECTION 5: Firefighting measures

Special precautions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

6.3 Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

SECTION 7: Handling and storage

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities : Store between the following temperatures: 2 to 40°C (35.6 to 104°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Storage hazard class Huntsman Advanced Materials : Storage class 10, Environmentally hazardous liquids

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived effect levels

No DELs available.

Predicted effect concentrations

No PECs available.

8.2 Exposure controls

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Material of gloves for long term application (BTT>480min): : Ethyl Vinyl Alcohol Laminate (EVAL), butyl rubber

Material of gloves for short term/splash application (10min <BTT<480min): : neoprene, nitrile rubber

(BTT = Break Through Time)

Use gloves approved to relevant standards e.g. EN 374 (Europe), F739 (US). Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material and dexterity. Always seek advice from glove suppliers. Additional information can be found for instance at www.gisbau.de.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : In case of inadequate ventilation wear respiratory protection. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Liquid. [Paste.]

Colour : Off-white.

Odour : Slight

Odour threshold : Not available.

SECTION 9: Physical and chemical properties

pH : 7 [Conc. (% w/w): 50%]

Melting point/freezing point : Not available.

Initial boiling point and boiling range : >200°C

Flash point : Closed cup: 200°C [DIN 51758 EN 22719 (Pensky-Martens Closed Cup)]

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Burning time : Not applicable.

Burning rate : Not applicable.

Upper/lower flammability or explosive limits : Not available.

Vapour pressure : 0.001 kPa [room temperature]

Vapour density : Not available.

Relative density : Not available.

Solubility(ies)

Water solubility : practically insoluble

20 deg C

Partition coefficient: n-octanol/water ($LogK_{ow}$) : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : >200°C

Viscosity : Dynamic: Not available.
Kinematic: Not available.
Kinematic (40°C): Not available.

Explosive properties : Not available.

Oxidising properties : Not available.

9.2 Other information

Density : 1.16 g/cm³ [25°C (77°F)]

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : The product is stable.

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid : No specific data.

10.5 Incompatible materials : strong acids, strong bases, strong oxidising agents

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Decomposition products may include the following materials:Carbon oxides, Burning produces obnoxious and toxic fumes.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Endpoint	Species	Result	Exposure
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	LC0 Inhalation Vapour	Rat - Male	0.00001 ppm	5 hours
	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat - Female	>2000 mg/kg	-

Conclusion/Summary : No additional information.

Acute toxicity estimates

Not available.

Irritation/Corrosion

Product/ingredient name	Test	Species	Route of exposure	Result
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	OECD 404 Acute Dermal Irritation/ Corrosion	Rabbit	Skin	Mild irritant
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes	Mild irritant

Conclusion/Summary

Skin : reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700) — Irritating to skin.

Eyes : reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700) — Irritating to eyes.

Respiratory : No additional information.

Sensitiser

Product/ingredient name	Test	Route of exposure	Species	Result
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	OECD 429 Skin Sensitisation: Local Lymph Node Assay	skin	Mouse	Sensitising

Conclusion/Summary

Skin : No additional information.

Respiratory : No additional information.

Mutagenicity

SECTION 11: Toxicological information

Product/ingredient name	Test	Result
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	OECD 471 Bacterial Reverse Mutation Test	Positive
	OECD 476 In vitro Mammalian Cell Gene Mutation Test	Positive
	OECD 478 Genetic Toxicology: Rodent Dominant Lethal Test	Negative
	EPA OPPTS	Negative

Conclusion/Summary : No additional information.

Carcinogenicity

Product/ingredient name	Test	Species	Exposure	Result	Route of exposure	Target organs
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat	2 years; 7 days per week	Negative	Oral	-
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat	2 years; 5 days per week	Negative	Dermal	-
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Mouse	2 years; 3 days per week	Negative	Dermal	-

Conclusion/Summary : No additional information.

Reproductive toxicity

Product/ingredient name	Test	Species	Result/Result type	Target organs
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	OECD 416 Two-Generation Reproduction Toxicity Study	Rat	Oral: 540 mg/kg NOEL	-

Conclusion/Summary : No additional information.

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	>540 mg/kg NOEL
	EPA CFR	Rabbit - Female	>300 mg/kg NOEL
	OECD 414 Prenatal Developmental Toxicity Study	Rabbit - Female	180 mg/kg NOAEL

Conclusion/Summary : No additional information.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

SECTION 11: Toxicological information

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Inhalation : No known significant effects or critical hazards.

Ingestion : Irritating to mouth, throat and stomach.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Eye contact : Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : No specific data.

Ingestion : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Test	Result type	Result	Target organs
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	NOAEL -	50 mg/kg	-
	OECD 411 Subchronic Dermal Toxicity: 90-day Study	NOEL	10 mg/kg	-
	OECD 411 Subchronic Dermal Toxicity: 90-day Study	NOAEL	100 mg/kg	-

Conclusion/Summary : No additional information.

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Other information : Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Test	Endpoint	Exposure	Species	Result
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	-	Acute EC50	72 hours Static	Algae	9.4 mg/l
	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute EC50	48 hours Static	Daphnia	1.7 mg/l
	-	Acute IC50	3 hours Static	Bacteria	>100 mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute LC50	96 hours Static	Fish	1.5 mg/l
	OECD 211 Daphnia Magna Reproduction Test	Chronic NOEC	21 days Semi-static	Daphnia	0.3 mg/l

Conclusion/Summary : No additional information.

12.2 Persistence and degradability

Product/ingredient name	Test	Period	Result
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	OECD Derived from OECD 301F (Biodegradation Test)	28 days	5 %

Conclusion/Summary : reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700) Not readily biodegradable.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	Fresh water 4.83 days Fresh water 3.58 days Fresh water 7.1 days	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
reaction product: bisphenol A-(epichlorhydrin); epoxy resin (number average molecular weight < 700)	3.242	31	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

Not applicable.

SECTION 12: Ecological information

12.6 Other adverse effects : No known significant effects or critical hazards.

12.7 Other ecological information

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

Hazardous waste : Yes.

European waste catalogue (EWC)

Waste code	Waste designation
07 02 08*	other still bottoms and reaction residues

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

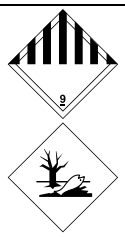
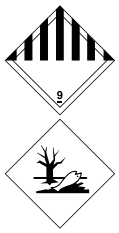
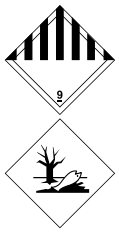
Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	14.1 UN number	14.2 UN proper shipping name
ADR/RID	UN3082	Environmentally hazardous substance, liquid, n.o.s. BISPHENOL A EPOXY RESIN
IMDG	UN3082	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN). Marine pollutant (Bisphenol A epoxy resin)
IATA	UN3082	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)

	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards	14.6 Special precautions for user	Additional information

SECTION 14: Transport information

ADR/RID	9 	III	Yes.	**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	**Hazard identification number** 90 **Special provisions** 274, 335, 601 **Tunnel code** E
IMDG	9 	III	Yes.	**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	**Emergency schedules (EmS)** F-A, S-F
IATA	9 	III	Yes.	**Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.	**Passenger and Cargo Aircraft** Quantity limitation: 450 L Packaging instructions: 964 **Cargo Aircraft Only**Quantity limitation: 450 L Packaging instructions: 964

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

This product is compliant with the REACH Regulation EC 1907/2006.
Huntsman has pre-registered and is registering all of the substances that it manufactures in or imports into the European Economic Area (EEA) that are subject to Title II of the REACH Regulation.

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Other EU regulations

Europe inventory : All components are listed or exempted.

Black List Chemicals : Not listed

Priority List Chemicals : Not listed

Integrated pollution prevention and control list (IPPC) - Air : Not listed

Integrated pollution prevention and control list (IPPC) - Water : Not listed

National regulations

References : The provision of Safety Data Sheets comes under Regulation 6 of CHIP (CHIP is the recognised abbreviation for the Chemicals Hazard Information and Packaging Regulations). This is an addition to the Health and Safety at Work Act 1974.

Australia inventory (AICS) : All components are listed or exempted.

Canada inventory : All components are listed or exempted.

China inventory (IECSC) : All components are listed or exempted.

Japan inventory : All components are listed or exempted.

Korea inventory (KECI) : All components are listed or exempted.

New Zealand Inventory of Chemicals (NZIoC) : All components are listed or exempted.

Philippines inventory (PICCS) : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

SECTION 15: Regulatory information

Chemical Weapons Convention List Schedule III Chemicals : Not listed

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Skin Irrit. 2, H315	Calculation method
Eye Irrit. 2, H319	Calculation method
Skin Sens. 1, H317	Calculation method
Aquatic Chronic 2, H411	Calculation method

Full text of abbreviated H statements :
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS] :
Aquatic Chronic 2, H411 LONG-TERM AQUATIC HAZARD - Category 2
Eye Irrit. 2, H319 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
Skin Irrit. 2, H315 SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1, H317 SKIN SENSITIZATION - Category 1

Full text of abbreviated R phrases : R36/38- Irritating to eyes and skin.
R43- May cause sensitisation by skin contact.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Full text of classifications [DSD/DPD] : Xi - Irritant
N - Dangerous for the environment

(M)SDS no. : 00051026

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Version : 2

Notice to reader

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN

SECTION 16: Other information

HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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1. PRODUCT AND COMPANY NAME

PRODUCT CODE AND NAME
31492 GASOLINE 95 RON, UNLEADED
DESCRIPTION
Unleaded Automotive Gasoline.
COMPANY
CHEVRON LIMITED
1 Westferry Circus, Canary Wharf
London E14 4HA
U.K.
Tel : 0044/20 7719 3000
Fax : 0044/20 7719 5130
Emergency Phone Number : 0044/(0)18 65 407 333

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Name	% Wt	CAS No.	EC No.
Gasoline	95 - 99,99	86290-81-5	289-220-8

F+ R 12 Extremely flammable.
Xn R 65 Harmful: may cause lung damage if swallowed.
Xi R 38 Irritating to skin.
T R 45 May cause cancer.
N R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R 67 Vapours may cause drowsiness and dizziness

Product contains small amounts of additives.

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3. HAZARDS IDENTIFICATION

Product classification

EXTREMELY FLAMMABLE

CARCINOGENIC CATEGORY 2

DANGEROUS FOR THE ENVIRONMENT

Acute effects of exposure to man

Inhalation

Vapours or mist may cause irritation of the nose and throat , headache, nausea, vomiting, dizziness, drowsiness, euphoria, loss of coordination, and disorientation. In poorly ventilated areas or confined spaces or in case of deliberate inhalation ofvapour unconsciousness, asphyxiation and death may result.

Skin contact

Prolonged or widespread skin contact may result in the absorption of potentially harmful amounts of

	material. Brief contact may cause slight irritation. Prolonged contact, as with clothing wetted with material, may cause more severe irritation and discomfort, seen as local redness and swelling. Believed not to be a skin sensitiser.
Eye contact	May cause irritation, experienced as mild discomfort and seen as slight excess redness of the eye.
Ingestion	If more than several mouthfuls are swallowed, abdominal discomfort, nausea and diarrhoea may occur. Although gasoline is of low to moderate oral toxicity to adults, ingestion of even small quantities may prove dangerous or fatal to children. Aspirationmay occur during swallowing or vomiting resulting in lung damage which may prove fatal.
Chronic effects of exposure to man	
Medical conditions aggravated by exposure	Because of its irritating properties, repeated skin contact may aggravate an existing dermatitis (skin condition).
Other remarks	This product contains benzene. Prolonged and repeated exposure to benzene has been associated with aplastic anaemia and leukaemia in humans.
Effects of exposure to the environment	Consider that potential for bioaccumulation and/or persistence in the aquatic environment is low to non-existent.

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4. FIRST AID MEASURES

Route of exposure

Inhalation	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may administer oxygen. Get immediate medical attention. External cardiac massage may be instituted if the heart has stopped.
Skin contact	Wash skin with plenty of soap and water for several minutes. In extreme situations of saturation with this product, first drench with water, then remove clothing as soon as possible and wash skin with soap and water. Seek medical advice if skin becomes red, swollen or painful.

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Get medical attention.
Ingestion	Do not induce vomiting. Get medical attention. Never give anything by mouth to an unconscious or convulsing person.
Other recommendations	Aspiration of this product during induced vomiting can result in lung injury which may be fatal. If evacuation of stomach contents is considered necessary, use method least likely to cause aspiration, such as gastric lavage after endotrachealintubation. Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associatedwith handling contaminated clothing.

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5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Use water fog, dry powder, foam or carbon dioxide. Use water to cool fire-exposed containers. If a leak or spill has not ignited, use water fog to disperse the vapours and to provide protection for personnel attempting to stop the leak.
Extinguishing media which must not be used for safety reasons	Water jet
Special exposure hazards arising from the substance or preparation itself,	
combustion products, resulting gases	In case of fire - Always call the fire brigade. Small fires, such as those capable of being fought with a hand-held extinguisher, can normally be fought by a person who has received instruction on the hazards of flammable liquid fires. Fires that arebeyond that stage should only be tackled by people who have received hands-on training. Ensure escape path is available. Gasoline vapours are heavier than air and may travel a considerable distance to a source of ignition and flash back. Flowing gasoline can generate static electricity and cause a fire or explosion if a spark occurs in a flammable vapour-air atmosphere.When handling, use non-sparking tools, ground and bond

all containers.

Special protective equipment for firefighters	The nature of special protective equipment required will depend upon the size of the fire, the degree of confinement of the fire and the natural ventilation available. Fire-resistant clothing and self-contained breathing apparatus is recommended forfires in confined spaces and poorly-ventilated areas. Full fire-proof clothing is recommended for any large fires involving this product.

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6. ACCIDENTAL RELEASE MEASURES

Procedures in case of accidental release or leakage	Eliminate all ignition sources including internal combustion engines and power tools. Ventilate area. Keep people away. Stay upwind and warn of possible downwind explosion hazard. Avoid breathing vapour. Use self-contained breathing apparatus orsupplied air mask for large spills or confined areas. Avoid contact with skin, eyes or clothing. Contain spill if possible. Remove with inert absorbent. Prevent entry into sewers and waterways.

---

7. HANDLING AND STORAGE

Handling	Use spark-proof tools. Material may be at elevated temperatures and/or pressures. Exercise care when opening bleeders and sampling ports. Avoid spillage onto hot exhausts and engine parts during refuelling. Never syphon this product by mouth. Do not empty into drains. Use explosion-proof equipment to maintain adequate ventilation to meet occupational exposure limits, (see below), prevent accumulation of explosive air-gas mixtures, and avoid significant oxygen displacement. Oxygen levels should be at least 19.5% inconfined spaces or other work areas.
Storage	Transport, handle and store in accordance with applicable local regulations and only in labelled containers designed for this product. Ground and bond shipping container, transfer line, and receiving container. Keep away from sparks, flame and othersources of ignition. Protect containers against static electricity, lightning and physical damage. Hot work (eg cutting or welding) must not be carried out on or near any container used for storage of this product unless it has been made safe bypurging or

	other suitable means. Empty product containers may contain product residue. Do not reuse empty containers without commercial cleaning or reconditioning. Special health precautions must be taken during cleaning or maintenance operations of any storage tanks which may have contained leaded product at any time. In addition any sludge must be disposed of in accordance with local waste disposal regulations.
Specific use (s)	Never use for lighting fires. THIS PRODUCT IS INTENDED FOR USE AS A MOTOR FUEL ONLY.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory protection	Airborne concentrations should be kept to lowest levels possible. If vapour, mist or dust is generated, use approved Filtering half mask (disposable) respirator (A1P1-filter) as appropriate. Supplied air respiratory protection should be used forcleaning large spills or upon entry into tanks, vessels, or other confined spaces.
Hand and skin protection	Protective clothing such as Flame retardant uniforms, coveralls or lab coats should be worn. Launder or dry-clean when soiled. North Red PVC gloves (Ref. 725), Nitrile Rubber or Viton gloves and lace up safety boots with steel toecaps resistant tochemicals and petroleum distillates required.
Eye protection	Safety glasses, chemical type goggles or full face shield recommended to prevent eye contact.
Exposure limit for the product	Gasoline : OSHA PEL-TWA 300 ppm STEL 500 ppm ; ACGIH TLV-TWA 300 ppm STEL 500 ppm

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear liquid (some grades may be dyed)
Odour	Gasoline odour
Flash point, °C	- 40 (PMCC)
Relative density	0,72 - 0,78 @ 15 °C
Viscosity	< 7 mm^2/s @ 40 °C

Ignition temperature, °C	220
Flammable limits % lower/upper	1,4 - 7,6
Boiling point/range, °C	25 - 210
Vapour pressure, at °C	450 - 1000 hPa @ 37.8 °C
Vapour density (Air = 1)	3 - 4
Water solubility	Immiscible

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10. STABILITY AND REACTIVITY

Conditions to avoid	Sources of ignition such as flames, sparks, hot surfaces.
Materials to avoid	Avoid contact with strong oxidising agents.
Hazardous decomposition products	Carbon monoxide, carbon dioxide, aldehydes and ketones.

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11. TOXICOLOGICAL INFORMATION

Acute

Inhalation	Likely to be irritating to the respiratory tract if high concentrations of mists or vapour are inhaled. May cause nausea, dizziness, headaches and drowsiness if high concentrations of vapour are inhaled. ABUSE : Under normal conditions of use the product is not hazardous ; however, abuse involving deliberate inhalation of very high concentrations of vapour, even for short periods, can produce unconsciousness and/or result in a sudden fatality.
Skin contact	Irritating to the skin. Likely to result in chemical burns following prolonged wetting of the skin (eg. after a road traffic accident). Believed not to be a skin sensitiser.
Eye contact	Unlikely to cause more than transient stinging or redness if accidental eye contact occurs.
Ingestion	Unlikely to cause harm if accidentally swallowed in small doses, though larger quantities may cause

	nausea and diarrhoea. Will injure the lungs if aspiration occurs, eg. during vomiting.
Chronic	Exposure to benzene may result in affects to the hematopoietic system causing blood disorders including anaemia and leukaemia. Benzene is classified by EC as a category 1 carcinogen - substances known to be carcinogenic to man. IARC assessment :benzene - carcinogenic in humans (Group 1).

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12. ECOLOGICAL INFORMATION

Mobility	Spillages may penetrate the soil causing ground water contamination.
Persistence and degradability	Inherently biodegradable according to EU criteria.
Potential to bioaccumulate	Consider that potential for bioaccumulation and/or persistence in the aquatic environment is low to non-existent.
Aquatic toxicity	Some short-term toxicity to aquatic and marine organisms. WGK = 3

---

13. DISPOSAL CONSIDERATIONS

Disposal	Dispose in a safe manner in accordance with local/national regulations. Materials contaminated with product should be treated as highly flammable. EWC- No : 13 07 02

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14. TRANSPORT INFORMATION

Sea transport

UN No	1203
Proper shipping name	GASOLINE
IMO, IMDG Class/Packing group	3 / II
Marine pollutant	P
EmS No	3-07

Road/rail transport

UN No	1203
Proper shipping name	MOTOR SPIRIT
ADR/RID Class/Packing group	3 / II
Hazard identification No	33
CEFIC Tremcard No	30GF1-I+II
UK Emergency action code	3YE

Inland waterways

ADNR Class	3 / II

Air transport

UN No	1203
Proper shipping name	GASOLINE
IATA/ICAO Class/Packing group	3 / II

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15. REGULATORY INFORMATION

Classification/Labelling information

Under the criteria of Directive EEC/67/548 (dangerous substances) and EEC/1999/45 (dangerous preparations) :

Symbol (letter notation) + Indication of danger

F+ EXTREMELY FLAMMABLE

T

N DANGEROUS FOR THE ENVIRONMENT

Risk phrases

F+ R 12 Extremely flammable.

Xn R 65 Harmful: may cause lung damage if swallowed.

Xi R 38 Irritating to skin.

T R 45 May cause cancer.

R 67 Vapours may cause drowsiness and dizziness

N R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases

S 2 Keep out of the reach of children.

S 7 Keep container tightly closed.

S 16 Keep away from sources of ignition - No smoking.

S 23 Do not breathe vapour.

S 24 Avoid contact with skin.

S 43 In case of fire, use CO2, dry chemical or foam. Never use water.

S 53 Avoid exposure - obtain special instructions before use.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

S 29 Do not empty into drains.

S 62 If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label.

Hazardous ingredients

Gasoline

Additional information

Refer to any national measures that may be relevant.

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16. OTHER INFORMATION

other information

The company recommends that all exposures to this product be minimized by strictly adhering to recommended occupational control procedures to avoid any potential adverse health effects.

Full text of risk phrases

F+ R 12 Extremely flammable.

Xn R 65 Harmful: may cause lung damage if swallowed.

Xi R 38 Irritating to skin.

T R 45 May cause cancer.

N R 51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R 67 Vapours may cause drowsiness and dizziness

Changes were made in sections : 2, 3, 7, 8, 9, 12,14, 15, 16

DATE ISSUED : 07/01/2004 Supersedes : 07/01/2004

All information contained in this Material Safety Data Sheet and, in particular, the health and safety and environmental information is accurate to the best of our knowledge and belief as at the date of issue specified. However, the Company makes no warranty or representation, express or implied, as to the accuracy or completeness of such information.

The provision of this Material Safety Data Sheet is not intended, of itself, to obviate the need for all users to satisfy themselves that the product described is suitable for their individual purposes and that the safety precautions and environmental advice are adequate for their individual purposes and situation. Further, it is the user's obligation to use this product safely and to comply with all applicable laws and regulations concerning the use of the product.

The company accepts no responsibility for any injury, loss or damage, consequent upon any failure to follow the safety and other recommendations contained in this Material Safety Data Sheet, nor from any hazards inherent in the nature of the material, nor from any abnormal use of the material.

"Data sheet prepared by Chevron Energy Technology Company

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Tel. : +/32/9/240 7352
Fax : +/32/9/240 7340"

Version nr : 1.11

SAFETY DATA SHEET

1. Identification

Product identifier	**Brakleen® Brake Parts Cleaner - Non-Chlorinated**
Other means of identification	
Product code	05088
Recommended use	Brake parts cleaner
Recommended restrictions	None known.

Manufacturer/Importer/Supplier/Distributor information

Manufactured or sold by:

Company name	CRC Industries, Inc.
Address	885 Louis Dr. Warminster, PA 18974 US
Telephone	
General Information	215-674-4300
Technical Assistance	800-521-3168
Customer Service	800-272-4620
24-Hour Emergency (CHEMTREC)	800-424-9300 (US) 703-527-3887 (International)
Website	www.crcindustries.com

2. Hazard(s) identification

Physical hazards	Flammable aerosols	Category 1
	Gases under pressure	Compressed gas
Health hazards	Acute toxicity, oral	Category 3
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Reproductive toxicity	Category 2
	Specific target organ toxicity, single exposure	Category 1
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Specific target organ toxicity, repeated exposure	Category 2
	Aspiration hazard	Category 1
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 2
	Hazardous to the aquatic environment, long-term hazard	Category 2
OSHA defined hazards	Not classified.	

Label elements

Signal word	Danger
Hazard statement	Extremely flammable aerosol. Contains gas under pressure; may explode if heated. Toxic if swallowed. May be fatal if swallowed and enters airways. Causes skin irritation. Causes serious eye irritation. May cause drowsiness or dizziness. May cause damage to organs (liver, kidneys, lungs, brain) through prolonged or repeated exposure. Suspected of damaging the unborn child. Causes damage to organs (eyes) by ingestion. Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not spray on an open flame or other ignition source. Do not apply while equipment is energized. Pressurized container: Do not pierce or burn, even after use. Extinguish all flames, pilot lights and heaters. Vapors will accumulate readily and may ignite. Do not breathe gas. Use only with adequate ventilation; maintain ventilation during use and until all vapors are gone. Open doors and windows or use other means to ensure a fresh air supply during use and while product is drying. If you experience any symptoms listed on this label, increase ventilation or leave the area. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection. Avoid release to the environment.
Response	If swallowed: Immediately call a poison center/doctor. Rinse mouth. Do NOT induce vomiting. If on skin: Wash with plenty of water. If skin irritation occurs: Get medical attention. Take off contaminated clothing and wash before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention. If exposed: Call a poison center/doctor. If exposed or concerned: Get medical attention. Collect spillage.
Storage	Store in a well-ventilated place. Store locked up. Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. Exposure to high temperature may cause can to burst.
Disposal	Dispose of contents/container in accordance with local/regional/national regulations.
Hazard(s) not otherwise classified (HNOC)	Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapor. May cause flash fire or explosion.

Supplemental information

16.8% of the mixture consists of component(s) of unknown acute oral toxicity. 66.2% of the mixture consists of component(s) of unknown acute hazards to the aquatic environment. 62% of the mixture consists of component(s) of unknown long-term hazards to the aquatic environment.
When exposed to extreme heat or hot surfaces, vapors may decompose to harmful or fatal corrosive gases such as formaldehyde.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Methanol		67-56-1	40 - 50
Toluene		108-88-3	10 - 20
Acetone		67-64-1	5 - 15
3-Methylhexane		589-34-4	5 - 10
Carbon dioxide		124-38-9	5 - 10
n-Heptane		142-82-5	5 - 10
Methylcyclohexane		108-87-2	3 - 5
Naphtha (petroleum), hydrotreated light		64742-49-0	3 - 5
Cyclohexane		110-82-7	1 - 3
Ethylbenzene		100-41-4	< 0.2

Specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.
Skin contact	Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Most important symptoms/effects, acute and delayed	May cause drowsiness and dizziness. Headache. Nausea, vomiting. Irritation of nose and throat. Aspiration may cause pulmonary edema and pneumonitis. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Upper respiratory tract irritation. Skin irritation. May cause redness and pain. Prolonged exposure may cause chronic effects.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.
General information	IF exposed or concerned: Get medical advice/attention. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media	Alcohol resistant foam. Water fog. Carbon dioxide (CO2). Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	Contents under pressure. Pressurized container may rupture when exposed to heat or flame. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. Static electricity accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Material will float and may ignite on surface of water. During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
Fire-fighting equipment/instructions	In case of fire: Stop leak if safe to do so. Move containers from fire area if you can do so without risk. Containers should be cooled with water to prevent vapor pressure build up.
General fire hazards	Extremely flammable aerosol. Contents under pressure. Pressurized container may rupture when exposed to heat or flame.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Remove all possible sources of ignition in the surrounding area. Many vapors are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not breathe gas. Emergency personnel need self-contained breathing equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Use appropriate containment to avoid environmental contamination. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. This product is miscible in water. Stop the flow of material, if this is without risk. Prevent product from entering drains. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground. Inform appropriate managerial or supervisory personnel of all environmental releases. Use appropriate containment to avoid environmental contamination.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimize fire risks from flammable and combustible materials (including combustible dust and static accumulating liquids) or dangerous reactions with incompatible materials. Pressurized container: Do not pierce or burn, even after use. Do not use if spray button is missing or defective. Do not spray on a naked flame or any other incandescent material. Do not smoke while using or until sprayed surface is thoroughly dry. Do not cut, weld, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition. Use caution around energized equipment. The metal container will conduct electricity if it contacts a live source. This may result in injury to the user from electrical shock and/or flash fire. Do not breathe mist or vapor. Do not breathe gas. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Do not taste or swallow. When using, do not eat, drink or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Use only in well-ventilated areas. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices. Avoid release to the environment. For product usage instructions, please see the product label.

Conditions for safe storage, including any incompatibilities

Level 3 Aerosol.

Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C/122 °F. Do not puncture, incinerate or crush. Do not handle or store near an open flame, heat or other sources of ignition. This material can accumulate static charge which may cause spark and become an ignition source. Avoid spark promoters. These alone may be insufficient to remove static electricity. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Acetone (CAS 67-64-1)	PEL	2400 mg/m3 1000 ppm
Carbon dioxide (CAS 124-38-9)	PEL	9000 mg/m3 5000 ppm
Cyclohexane (CAS 110-82-7)	PEL	1050 mg/m3 300 ppm
Ethylbenzene (CAS 100-41-4)	PEL	435 mg/m3 100 ppm
Methanol (CAS 67-56-1)	PEL	260 mg/m3 200 ppm
Methylcyclohexane (CAS 108-87-2)	PEL	2000 mg/m3 500 ppm
n-Heptane (CAS 142-82-5)	PEL	2000 mg/m3 500 ppm

US. OSHA Table Z-2 (29 CFR 1910.1000)

Components	Type	Value
Toluene (CAS 108-88-3)	Ceiling	300 ppm
	TWA	200 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
3-Methylhexane (CAS 589-34-4)	STEL	500 ppm
	TWA	400 ppm
Acetone (CAS 67-64-1)	STEL	500 ppm
	TWA	250 ppm
Carbon dioxide (CAS 124-38-9)	STEL	30000 ppm
	TWA	5000 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
Cyclohexane (CAS 110-82-7)	TWA	100 ppm
Ethylbenzene (CAS 100-41-4)	TWA	20 ppm
Methanol (CAS 67-56-1)	STEL	250 ppm
	TWA	200 ppm
Methylcyclohexane (CAS 108-87-2)	STEL	500 ppm
	TWA	400 ppm
n-Heptane (CAS 142-82-5)	STEL	500 ppm
	TWA	400 ppm
Toluene (CAS 108-88-3)	TWA	20 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Acetone (CAS 67-64-1)	TWA	590 mg/m3
		250 ppm
Carbon dioxide (CAS 124-38-9)	STEL	54000 mg/m3
		30000 ppm
	TWA	9000 mg/m3
		5000 ppm
Cyclohexane (CAS 110-82-7)	TWA	1050 mg/m3
		300 ppm
Ethylbenzene (CAS 100-41-4)	STEL	545 mg/m3
		125 ppm
	TWA	435 mg/m3
		100 ppm
Methanol (CAS 67-56-1)	STEL	325 mg/m3
		250 ppm
	TWA	260 mg/m3
		200 ppm
Methylcyclohexane (CAS 108-87-2)	TWA	1600 mg/m3
		400 ppm
n-Heptane (CAS 142-82-5)	Ceiling	1800 mg/m3
		440 ppm
	TWA	350 mg/m3
		85 ppm
Toluene (CAS 108-88-3)	STEL	560 mg/m3
		150 ppm
	TWA	375 mg/m3
		100 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Acetone (CAS 67-64-1)	25 mg/l	Acetone	Urine	*
Ethylbenzene (CAS 100-41-4)	0.15 g/g	Sum of mandelic acid and phenylglyoxylic acid	Creatinine in urine	*
Methanol (CAS 67-56-1)	15 mg/l	Methanol	Urine	*
Toluene (CAS 108-88-3)	0.3 mg/g	o-Cresol, with hydrolysis	Creatinine in urine	*
	0.03 mg/l	Toluene	Urine	*

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
	0.02 mg/l	Toluene	Blood	*

* - For sampling details, please see the source document.

Exposure guidelines

US - California OELs: Skin designation

Methanol (CAS 67-56-1) Can be absorbed through the skin.
Toluene (CAS 108-88-3) Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

Methanol (CAS 67-56-1) Skin designation applies.
Toluene (CAS 108-88-3) Skin designation applies.

US - Tennessee OELs: Skin designation

Methanol (CAS 67-56-1) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

Methanol (CAS 67-56-1) Can be absorbed through the skin.

US NIOSH Pocket Guide to Chemical Hazards: Skin designation

Methanol (CAS 67-56-1) Can be absorbed through the skin.

Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower should be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection Wear protective gloves such as: Nitrile. Neoprene. Polyvinyl alcohol (PVA).

Other Wear appropriate chemical resistant clothing.

Respiratory protection If engineering controls are not feasible or if exposure exceeds the applicable exposure limits, use a NIOSH-approved cartridge respirator with an organic vapor cartridge. Use a self-contained breathing apparatus in confined spaces and for emergencies. Air monitoring is needed to determine actual employee exposure levels.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations When using do not smoke. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance

Physical state Liquid.

Form Aerosol.

Color Clear.

Odor Solvent.

Odor threshold Not available.

pH Not available.

Melting point/freezing point -195.9 °F (-126.6 °C) estimated

Initial boiling point and boiling range 132.9 °F (56.1 °C) estimated

Flash point 0 °F (-17.8 °C) Tag Closed Cup

Evaporation rate Fast.

Flammability (solid, gas) Not available.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) 1 % estimated

Flammability limit - upper (%)	36 % estimated
Vapor pressure	4438 hPa estimated
Vapor density	> 1 (air = 1)
Relative density	0.84 estimated
Solubility (water)	Slightly soluble.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	539.6 °F (282 °C) estimated
Decomposition temperature	Not available.
Viscosity (kinematic)	Not available.
Percent volatile	92.4 % estimated

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Avoid heat, sparks, open flames and other ignition sources. Contact with incompatible materials. When exposed to extreme heat or hot surfaces, vapors may decompose to harmful or fatal corrosive gases such as formaldehyde.
Incompatible materials	Acids. Alkalies. Reducing agents. Strong oxidizing agents. Hypochlorites. Peroxides. Aluminum. Magnesium. Sodium. Zinc.
Hazardous decomposition products	Carbon oxides. Formaldehyde.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause damage to organs through prolonged or repeated exposure by inhalation. May cause drowsiness and dizziness. Headache. Nausea, vomiting.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye irritation.
Ingestion	Toxic if swallowed. Even small amounts (30-250 ml methanol) may be fatal. Symptoms are stomach ache, nausea, vomiting, dullness, visual disorder and blindness. Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.
Symptoms related to the physical, chemical and toxicological characteristics	Headache. May cause drowsiness and dizziness. Nausea, vomiting. Aspiration may cause pulmonary edema and pneumonitis. Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain.

Information on toxicological effects

Acute toxicity May be fatal if swallowed and enters airways. Narcotic effects.

Product	Species	Test Results
Brakleen® Brake Parts Cleaner - Non-Chlorinated		
Acute		
Dermal		
LD50	Rabbit	6702 mg/kg estimated
Inhalation		
LC50	Rat	58 mg/l, 4 Hours estimated
Oral		
LD50	Human	110 mg/kg estimated
	Rat	5943 mg/kg estimated

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Causes serious eye irritation.

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization This product is not expected to cause skin sensitization.

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity Based on available data, the classification criteria are not met.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not available.

US. National Toxicology Program (NTP) Report on Carcinogens

Not available.

Reproductive toxicity Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure Causes damage to organs (eyes) by ingestion. May cause drowsiness and dizziness.

Specific target organ toxicity - repeated exposure May cause damage to organs through prolonged or repeated exposure: Liver. Kidneys. Lungs. Brain.

Aspiration hazard May be fatal if swallowed and enters airways. If aspirated into lungs during swallowing or vomiting, may cause chemical pneumonia, pulmonary injury or death.

Chronic effects May cause damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity Toxic to aquatic life with long lasting effects.

Components		Species	Test Results
Acetone (CAS 67-64-1)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	10294 - 17704 mg/l, 48 hours
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	4740 - 6330 mg/l, 96 hours
Cyclohexane (CAS 110-82-7)			
Aquatic			
Fish	LC50	Fathead minnow (Pimephales promelas)	23.03 - 42.07 mg/l, 96 hours
Ethylbenzene (CAS 100-41-4)			
Aquatic			
Acute			
Crustacea	EC50	Water flea (Daphnia magna)	2.1 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas)	12.1 mg/l, 96 hours
Methanol (CAS 67-56-1)			
Aquatic			
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	18000 - 20000 mg/l, 96 hours
Acute			
Crustacea	EC50	Water flea (Daphnia magna)	> 10000 mg/l, 48 hours
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	18000 - 20000 mg/l, 96 hours
Methylcyclohexane (CAS 108-87-2)			
Aquatic			
Fish	LC50	Striped bass (Morone saxatilis)	5.8 mg/l, 96 hours
n-Heptane (CAS 142-82-5)			
Aquatic			
Acute			
Fish	LC50	Fathead minnow (Pimephales promelas)	2.1 - 2.98 mg/l, 96 hours
Toluene (CAS 108-88-3)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia magna)	5.46 - 9.83 mg/l, 48 hours

Components		Species	Test Results
Fish	LC50	Coho salmon,silver salmon (Oncorhynchus kisutch)	8.11 mg/l, 96 hours

* Estimates for product may be based on additional component data not shown.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)

Acetone	-0.24
Cyclohexane	3.44
Ethylbenzene	3.15
Methanol	-0.77
Methylcyclohexane	3.61
n-Heptane	4.66
Toluene	2.73

Mobility in soil No data available.

Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal of waste from residues / unused products This material and its container must be disposed of as hazardous waste. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Contents under pressure. Do not puncture, incinerate or crush. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose in accordance with all applicable regulations.

Hazardous waste code D001: Waste Flammable material with a flash point <140 F
F005: Waste Non-halogenated Solvent - Spent Non-halogenated Solvent

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN1950
UN proper shipping name Aerosols, flammable, Limited Quantity
Transport hazard class(es)
Class 2.1
Subsidiary risk 6.1(PGIII)
Label(s) 2.1
Packing group Not applicable.
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Special provisions N82
Packaging exceptions 306
Packaging non bulk None
Packaging bulk None

IATA

UN number UN1950
UN proper shipping name Aerosols, flammable, containing substances in Division 6.1, Packing Group III
Transport hazard class(es)
Class 2.1
Subsidiary risk 6.1(PGIII)
Packing group Not applicable.
Environmental hazards No.
ERG Code 10P
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Other information
Passenger and cargo aircraft Allowed with restrictions.
Cargo aircraft only Allowed with restrictions.

IMDG

UN number	UN1950
UN proper shipping name	AEROSOLS
Transport hazard class(es)	
Class	2
Subsidiary risk	6.1(PGIII)
Packing group	Not applicable.
Environmental hazards	No.
EmS	Not available.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

SARA 304 Emergency release notification

Not regulated.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

Cyclohexane (CAS 110-82-7)
Ethylbenzene (CAS 100-41-4)
Methanol (CAS 67-56-1)
Toluene (CAS 108-88-3)

CERCLA Hazardous Substance List (40 CFR 302.4)

Acetone (CAS 67-64-1)
Cyclohexane (CAS 110-82-7)
Ethylbenzene (CAS 100-41-4)
Methanol (CAS 67-56-1)
Toluene (CAS 108-88-3)

CERCLA Hazardous Substances: Reportable quantity

Acetone (CAS 67-64-1)	5000 LBS
Cyclohexane (CAS 110-82-7)	1000 LBS
Ethylbenzene (CAS 100-41-4)	1000 LBS
Methanol (CAS 67-56-1)	5000 LBS
Toluene (CAS 108-88-3)	1000 LBS

Spills or releases resulting in the loss of any ingredient at or above its RQ require immediate notification to the National Response Center (800-424-8802) and to your Local Emergency Planning Committee.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Methanol (CAS 67-56-1)
Toluene (CAS 108-88-3)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Acetone (CAS 67-64-1)	6532
Toluene (CAS 108-88-3)	6594

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Acetone (CAS 67-64-1)	35 %WV
Toluene (CAS 108-88-3)	35 %WV

DEA Exempt Chemical Mixtures Code Number

Acetone (CAS 67-64-1)	6532
Toluene (CAS 108-88-3)	594

FEMA Priority Substances Respiratory Health and Safety in the Flavor Manufacturing Workplace

Acetone (CAS 67-64-1)	Low priority

Food and Drug Administration (FDA)	Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 311/312 Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - Yes Reactivity Hazard - No
SARA 302 Extremely hazardous substance	No

US state regulations

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Acetone (CAS 67-64-1)
Ethylbenzene (CAS 100-41-4)
Methanol (CAS 67-56-1)
Naphtha (petroleum), hydrotreated light (CAS 64742-49-0)
Toluene (CAS 108-88-3)

US. New Jersey Worker and Community Right-to-Know Act

3-Methylhexane (CAS 589-34-4)
Acetone (CAS 67-64-1)
Carbon dioxide (CAS 124-38-9)
Methylcyclohexane (CAS 108-87-2)
n-Heptane (CAS 142-82-5)

US. Massachusetts RTK - Substance List

3-Methylhexane (CAS 589-34-4)
Acetone (CAS 67-64-1)
Carbon dioxide (CAS 124-38-9)
Cyclohexane (CAS 110-82-7)
Methanol (CAS 67-56-1)
Methylcyclohexane (CAS 108-87-2)
n-Heptane (CAS 142-82-5)
Toluene (CAS 108-88-3)

US. California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

US. Rhode Island RTK

Acetone (CAS 67-64-1)
Cyclohexane (CAS 110-82-7)
Methanol (CAS 67-56-1)
Toluene (CAS 108-88-3)

US. New Jersey Worker and Community Right-to-Know Act

Cyclohexane (CAS 110-82-7)
Methanol (CAS 67-56-1)
Toluene (CAS 108-88-3)

US. Pennsylvania Worker and Community Right-to-Know Law

Acetone (CAS 67-64-1)
Cyclohexane (CAS 110-82-7)
Methanol (CAS 67-56-1)
Toluene (CAS 108-88-3)
Benzene (CAS 71-43-2)
Ethylbenzene (CAS 100-41-4)
Xylene (CAS 1330-20-7)
3-Methylhexane (CAS 589-34-4)
Carbon dioxide (CAS 124-38-9)
Methylcyclohexane (CAS 108-87-2)
n-Heptane (CAS 142-82-5)

US. California Proposition 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

Benzene (CAS 71-43-2)	Listed: February 27, 1987
Cumene (CAS 98-82-8)	Listed: April 6, 2010

Ethanal (CAS 75-07-0)	Listed: April 1, 1988
Ethylbenzene (CAS 100-41-4)	Listed: June 11, 2004
Naphthalene (CAS 91-20-3)	Listed: April 19, 2002

US - California Proposition 65 - CRT: Listed date/Developmental toxin

Benzene (CAS 71-43-2)	Listed: December 26, 1997
Methanol (CAS 67-56-1)	Listed: March 16, 2012
Toluene (CAS 108-88-3)	Listed: January 1, 1991

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

Benzene (CAS 71-43-2)	Listed: December 26, 1997

Volatile organic compounds (VOC) regulations

EPA

VOC content (40 CFR 51.100(s))	84 %
Consumer products (40 CFR 59, Subpt. C)	Not regulated

State

Consumer products	This product is regulated as a Brake Cleaner. This product is not compliant to be sold for use in California, Connecticut, Delaware, the District of Columbia, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island and parts of Utah and Virginia.
VOC content (CA)	84 %
VOC content (OTC)	84 %

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date	05-13-2015
Revision date	01-13-2016
Prepared by	Allison Cho
Version #	02
Further information	CRC # 483A
HMIS® ratings	Health: 3* Flammability: 4 Physical hazard: 0 Personal protection: B
NFPA ratings	Health: 3 Flammability: 4 Instability: 0

NFPA ratings

Disclaimer

The information contained in this document applies to this specific material as supplied. It may not be valid for this material if it is used in combination with any other materials. This information is accurate to the best of CRC Industries' knowledge or obtained from sources believed by CRC to be accurate. Before using any product, read all warnings and directions on the label. For further clarification of any information contained on this (M)SDS consult your supervisor, a health & safety professional, or CRC Industries.

SAFETY DATA SHEET
CondorLube Wire & Chain Spray

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product name CondorLube Wire & Chain Spray

Applications Lubricant Anti-corrosion.

Supplier
Carl Stahl Evita Limited
Carl Stahl House,
Farfield Park Estate,
Rotherham, S63 5DB, GB
Tel: +44-1709-7630-61
Fax: +44-1709-7630-67
sales@carlstahlevita.co.uk
http://www.carlstahlevita.co.uk

Contact person Roy Fullthorpe

Manufacturer
Carl Stahl Câble SÂRL
Chemin du Neubrunnen 8
F-67140 Barr Cedex, France
Tel: +49-7162-40073075
Fax: +49-7162-40078839

Emergency telephone number National Poisons Information Service (NPIS), phone 0844 892 0111.
WEB: http://www.toxbase.org

2. HAZARDS IDENTIFICATION

Not regarded as a health, fire, explosion or environmental hazard under current legislation. Pressurized container - protect from sunlight and do not expose to temperatures exceeding 50°C.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS No.	Content	Symbol	Classification
nitrogen	231-783-9	7727-37-9	10-30 %	-	
ethanol	200-578-6	64-17-5	0-20 %	F	R-11

Section 16 contains detailed classification phrases.

Composition comments None of the components are subject to classification, or are present in quantities above regulatory disclosure limits.

4. FIRST AID MEASURES

General Remove victim immediately from source of exposure. Provide rest, warmth and fresh air.

Inhalation Move the exposed person to fresh air at once. Rinse nose and mouth with water.

Ingestion	Ingestion is not likely under the use as intended and described, product is an aerosol.
Skin	Wash the skin immediately with soap and water. Contact physician if irritation continues.
Eyes	Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Contact physician if irritation persists. Make sure to remove any contact lenses from the eyes before rinsing.

5. FIRE-FIGHTING MEASURES

Extinguishing media	Extinguish with foam, carbon dioxide, dry powder or water fog.
Special fire fighting procedures	Move container from fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. Avoid water in straight hose stream; will scatter and spread fire.
Specific hazards	Vapours are heavier than air and may spread near ground to sources of ignition.
Hazardous combustion products	Fire or high temperatures create: Carbon monoxide (CO). Carbon dioxide (CO2).
Protective measures in fire	Wear self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

6. ACCIDENTAL RELEASE MEASURES

Personal protection	Wear appropriate personal protective equipment - see Section 8.
Environmental protection	Prevent discharge of larger quantity to drain.
Spill cleanup methods	Extinguish all ignition sources. Avoid sparks, flames, heat and smoking. Ventilate. Absorb in vermiculite, dry sand or earth and place into containers. Collect and reclaim or dispose in sealed containers in licensed waste.

7. HANDLING AND STORAGE

Usage precautions	Do not breathe of aerosol mist. Avoid spilling, skin and eye contact. Ventilate well, avoid breathing vapours. Use approved respirator if air contamination is above accepted level. Eliminate all sources of ignition.
Storage precautions	Keep in cool, dry, ventilated storage and closed containers. Keep away from heat, sparks and open flame. Pressurised container: Must not be exposed for temperatures above 50°C.
Storage criteria	Compressed gas storage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredient name	CAS no.	Reference	LT Exp 8 Hrs	ST Exp 15 Min	Date
ethanol	64-17-5	WEL.	1000/1900 ppm/mg/m³		

Ingredient comments	WEL = Workplace exposure limits. SK= Skin absorbance, Rep= Reproduction, Carc= Carcinogenic Senz= Sensitisers, Mut= Carcinogenic
Ventilation	No specific ventilation requirements noted, but forced ventilation may still be required if air contamination exceeds acceptable level.
Respirators	If ventilation is insufficient, suitable respiratory protection must be provided. CCROVDM, CCR with organic vapour cartridge and dust and mist filter.
Protective gloves	Protective gloves must be used if there is a risk of direct contact or splash. Use protective gloves made of: Nitrile. Neoprene. Time of breakthrough is not known, change gloves regulary.
Eye protection	Wear approved chemical safety goggles where eye exposure is reasonably probable.
Other Protection	Wear appropriate clothing to prevent any possibility of skin contact.
Hygienic work practices	Wash promptly if skin becomes wet or contaminated. Promptly remove any clothing that becomes wet or contaminated.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Fluid. Aerosol.		
Colour	Clear. Light brown.		
Odour	Mild (or faint). No characteristic odour.		
Solubility description	Insoluble in water. Soluble in: Organic solvents (most).		
Boiling point (°C, interval)	<30	**Pressure**	760mmHg
Density (g/cm3)	1,1 - 1,2	**Temperature (°C)**	20
Flash point (°C)	<0	**Method**	

10. STABILITY AND REACTIVITY

Stability	Stable under normal temperature conditions and recommended use.
Conditions to avoid	Avoid excessive heat, flames and other sources of ignition.
Hazardous polymerisation	Will not polymerise.
Materials to avoid	Strong oxides. Strong acids.
Hazardous decomp. products	No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

Sensitization	No allergic reaction is known.
Genotoxicity	No known heritable or mutagenic effects.
Carcinogenicity	This substance has no evidence of carcinogenic properties.
Reproduction toxicity	No known hazardous effects on reproduction, fertility or to the unborn child.
Inhalation	Gas or vapour displaces oxygen available for breathing (asphyxiant).
Ingestion	Ingestion is not a likely route of exposure, the product is supplied as an aerosol.
Skin	May cause defatting of the skin, but is not an irritant. Contact with liquefied gas might cause frostbites, in some cases tissue damage.
Eyes	Splashes may irritate and cause redness. Risk of frost bite in the eyes, aerosol.
Route of entry	Inhalation. Skin and/or eye contact.

12. ECOLOGICAL INFORMATION

Ecotoxicity	Not classified as dangerous to the environment. However, the product should not be allowed to enter drains or water courses or be deposited where it can affect ground or surface waters.
Mobility	The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces.
Bioaccumulative potential	The product is not bioaccumulating.
Persistence and degradability	The product is easily biodegradable. BOD: 60 % (28 days)

13. DISPOSAL CONSIDERATIONS

General/cleaning	Waste is classified as hazardous waste.
Disposal methods	Confirm disposal procedures with environmental engineer and local regulations.
Waste class	14 06 waste organic solvents, refrigerants and foam/aerosol propellants
Contaminated packaging	The product packaging must be disposed of in compliance with the country specific

regulations.

14. TRANSPORT INFORMATION

General	No dangerous goods (ADR/RID, IMDG, IATA/ICAO)
Proper shipping name (national)	Flammable liquid, n.o.s. (isopropyl alcohol)
ROAD TRANSPORT (ADR):	
RAIL TRANSPORT (RID):	
SEA TRANSPORT (IMDG):	

15. REGULATORY INFORMATION

Contains	nitrogen ethanol
Safety phrases	S-23 Do not breathe gas/fumes/vapour/spray. Pressurised container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use.
EU directives	67/548/EEC, 1999/45/EC, 2001/58/EC, 2008/58/EC (REACH), 1272/2008/EC (30ATP).

16. OTHER INFORMATION

Explanations to R-phrases in section 3	R-11 Highly flammable.

*** Information revised since the previous version of the SDS**

Issued by	Essenticon AS, Leif Weldingsvei 14, N-3208 Sandefjord, Norway. Tel.: +47 33 42 34 50 - Fax: +47 33 42 34 59 www.essenticon.com
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Revision no.	1
Rev. no./repl. SDS generated	2010-04-15
Safety Data Sheet status	30 ATP.
Signature	R. E. Lunde
Disclaimer	The information in this data sheet is considered to be correct according to present knowledge and experience, but there is no guarantee that it is complete. It is therefore in the user´s interest to ensure that the information is sufficient for the area it is intended for.

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 25.06.2014 Version number 1 Revision: 25.06.2014

1 Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**

· **Trade name:** ***RIDGID HIGH PERFORMANCE THREAD CUTTING OIL***

· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.

· **Application of the substance / the mixture** Lubricant for Industrial use

· **1.3 Details of the supplier of the safety data sheet**

· **Manufacturer/Supplier:**
RIDGE TOOL EUROPE
INTERLEUVENLAAN,
RESEARCH PARK
HAASRODE,
3001 LEUVEN
BELGIUM
Tel.: +32 (0) 16380211
Fax: +32 (0) 16380210

· **Further information obtainable from:** Customer Service +32 (0) 16380211 (Office hours)

· **1.4 Emergency telephone number:**
During normal opening times: ++49/2947/88100
Customer Service +32 (0) 16380211 (Office hours)

2 Hazards identification

· **2.1 Classification of the substance or mixture**

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

F+; Extremely flammable

R12: Extremely flammable.

· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
Warning! Pressurized container.

· **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

· **2.2 Label elements**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.

· **Code letter and hazard designation of product:**

F+ Extremely flammable

· **Risk phrases:**
12 Extremely flammable.

· **Safety phrases:**
1/2 Keep locked up and out of the reach of children.
16 Keep away from sources of ignition - No smoking.
29/56 Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point.
46 If swallowed, seek medical advice immediately and show this container or label.
51 Use only in well-ventilated areas.

(Contd. on page 2)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 25.06.2014 Version number 1 Revision: 25.06.2014

Trade name: *RIDGID HIGH PERFORMANCE THREAD CUTTING OIL*

(Contd. of page 1)

· **Special labelling of certain preparations:**
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.
Do not spray on a naked flame or any incandescent material.
· **Classification in accordance with Directive 75/324/EEC:** Extremely flammable
· **2.3 Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **3.2 Chemical characterization: Mixtures**
· **Description:** Mixture of substances listed below with nonhazardous additions.

· **Dangerous components:**		
	Zinc dialkyldithiophosphat Xi R38-41 N R51/53	0.1-<0.3%
CAS: 68476-86-8 EINECS: 270-705-8 Index number: 649-203-00-1	Petroleum gases, liquefied, sweetened F+ R12 Carc. Cat. 1, Muta. Cat. 2	25-50%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

· **4.1 Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:**

Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** Rinse out mouth and then drink plenty of water.
· **4.2 Most important symptoms and effects, both acute and delayed** Gastric or intestinal disorders
· **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Firefighting measures

· **5.1 Extinguishing media**
· **Suitable extinguishing agents:**
Foam
Sand
Carbon dioxide
CO2, sand, extinguishing powder. Do not use water.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **5.2 Special hazards arising from the substance or mixture**
During heating or in case of fire poisonous gases are produced.
· **5.3 Advice for firefighters**
· **Protective equipment:** Wear self-contained respiratory protective device.
· **Additional information** Cool endangered receptacles with water spray.

(Contd. on page 3)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 25.06.2014 Version number 1 Revision: 25.06.2014

Trade name: *RIDGID HIGH PERFORMANCE THREAD CUTTING OIL*

(Contd. of page 2)

6 Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**
Keep away from ignition sources.
Ensure adequate ventilation
Wear protective equipment. Keep unprotected persons away.
· **6.2 Environmental precautions:**
Do not allow product to reach sewage system or any water course.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· **6.3 Methods and material for containment and cleaning up:**
Ensure adequate ventilation.
Do not flush with water or aqueous cleansing agents
Dispose of the material collected according to regulations.
· **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **7.1 Precautions for safe handling**
Store in cool, dry place in tightly closed receptacles.
Open and handle receptacle with care.
· **Information about fire - and explosion protection:**
Do not spray onto a naked flame or any incandescent material.
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C, i.e. electric lights. Do not pierce or burn, even after use.

· **7.2 Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Store in a cool location.
Observe official regulations on storing packagings with pressurized containers.
· **Information about storage in one common storage facility:**
Store away from flammable substances.
Store away from oxidizing agents.
Store away from foodstuffs.
· **Further information about storage conditions:**
Store under lock and key and out of the reach of children.
Store in cool, dry conditions in well sealed receptacles.
Keep container tightly sealed.
Do not seal receptacle gas tight.
Store in cool, dry conditions in well sealed receptacles.
Protect from heat and direct sunlight.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **8.1 Control parameters**
· **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
· **Additional information:** The lists valid during the making were used as basis.

(Contd. on page 4)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 25.06.2014 Version number 1 Revision: 25.06.2014

Trade name: *RIDGID HIGH PERFORMANCE THREAD CUTTING OIL*

(Contd. of page 3)

· **8.2 Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
The usual precautionary measures are to be adhered to when handling chemicals.
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
· **Respiratory protection:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
Use suitable respiratory protective device in case of insufficient ventilation.
· **Protection of hands:** Recommendation: Chemical resistant protective gloves (EN 374)
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**

Tightly sealed goggles

Use safety glasses according to EN 166 : 2001.

9 Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Aerosol
Colour:	Brown
· **Odour:**	Characteristic
· **Odour threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	-44 °C
· **Flash point:**	-60 °C
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	287 °C
· **Decomposition temperature:**	Not determined.
· **Self-igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/ vapour mixtures are possible.
· **Explosion limits:**	
Lower:	0.9 Vol %
Upper:	9.5 Vol %
· **Vapour pressure at 20 °C:**	0.1 hPa

(Contd. on page 5)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 25.06.2014 Version number 1 Revision: 25.06.2014

Trade name: *RIDGID HIGH PERFORMANCE THREAD CUTTING OIL*

(Contd. of page 4)

· **Density at 20 °C:**	0.5 g/cm³
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with water:**	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Solvent content:**	
Organic solvents:	0.0 %
· **9.2 Other information**	No further relevant information available.

10 Stability and reactivity

· **10.1 Reactivity** Reacts with strong oxidants and strong reducing agents under severe heat.
· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **10.3 Possibility of hazardous reactions** No dangerous reactions known.
· **10.4 Conditions to avoid** Temperatures above 50 °C can result in breakage of the container
· **10.5 Incompatible materials:** No further relevant information available.
· **10.6 Hazardous decomposition products:**
Emergence of flammable gases / vapors on contact with strong oxidizing agent' s possible.

11 Toxicological information

· **11.1 Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values relevant for classification:**		
Zinc dialkyldithiophosphat		
Oral	LD50	>15000 mg/kg (rat)
Dermal	LD50	4100 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** May cause skin irritation after repeated contact.
· **on the eye:** May cause slight irritation to the eyes.
· **Sensitization:** No sensitizing effects known.

12 Ecological information

· **12.1 Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **12.2 Persistence and degradability** No further relevant information available.
· **12.3 Bioaccumulative potential** No further relevant information available.
· **12.4 Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.

(Contd. on page 6)

Safety data sheet

according to 1907/2006/EC, Article 31

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Trade name: *RIDGID HIGH PERFORMANCE THREAD CUTTING OIL*

(Contd. of page 5)

· **12.5 Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **12.6 Other adverse effects** No further relevant information available.

13 Disposal considerations

· **13.1 Waste treatment methods**
· **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **14.1 UN-Number**	
· **ADR, IMDG, IATA**	UN1950
· **14.2 UN proper shipping name**	
· **ADR**	1950 AEROSOLS
· **IMDG**	AEROSOLS
· **IATA**	AEROSOLS, flammable
· **14.3 Transport hazard class(es)**	
· **ADR**	
· **Class**	2 5F Gases.
· **Label**	2.1
· **IMDG, IATA**	
· **Class**	2.1
· **Label**	2.1
· **14.4 Packing group**	
· **ADR, IMDG, IATA**	Void
· **14.5 Environmental hazards:**	
· **Marine pollutant:**	No
· **14.6 Special precautions for user**	Warning: Gases.
· **Danger code (Kemler):**	-
· **EMS Number:**	F-D,S-U
· **14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **ADR**	
· **Limited quantities (LQ)**	1L
· **Transport category**	2

(Contd. on page 7)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 25.06.2014 Version number 1 Revision: 25.06.2014

Trade name: *RIDGID HIGH PERFORMANCE THREAD CUTTING OIL*

(Contd. of page 6)

· **Tunnel restriction code**	D

15 Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Labelling according to EU guidelines:**
Observe the general safety regulations when handling chemicals.
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials.

· **Code letter and hazard designation of product:**

F+ Extremely flammable

· **Risk phrases:**
12 Extremely flammable.

· **Safety phrases:**
1/2 Keep locked up and out of the reach of children.
16 Keep away from sources of ignition - No smoking.
29/56 Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point.
46 If swallowed, seek medical advice immediately and show this container or label.
51 Use only in well-ventilated areas.

· **Special labelling of certain preparations:**
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use.
Do not spray on a naked flame or any incandescent material.

· **Classification in accordance with Directive 75/324/EEC:** Extremely flammable

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**
R12 Extremely flammable.
R38 Irritating to skin.
R41 Risk of serious damage to eyes.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Department issuing MSDS:** Customer Service +32 (0) 16380211 (Office hours)

Material Safety Data Sheet
The Dow Chemical Company

Product Name: D.E.R. 330 EPO Y RESIN

Issue Date: 06/16/2014
Print Date: 17 Jun 2014

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
D.E.R. 330 EPO Y RESIN

COMPANY IDENTIFICATION
The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
United States

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview
Color: Yellow
Physical State: viscous, Liquid.
Odor: Odorless to mild
Hazards of product:

WARNING May cause allergic skin reaction. May cause eye irritation. May cause skin irritation. Isolate area.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects
Eye Contact: May cause moderate eye irritation.
Skin Contact: Brief contact may cause moderate skin irritation with local redness.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Skin Sensitization: Has caused allergic skin reactions in humans. Has demonstrated the potential for contact allergy in mice.

(TM) Trademark

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material, mist or aerosols may cause respiratory irritation.
Ingestion: Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.
Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.
Cancer Information: Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEBPA). Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEBPA is not classified as a carcinogen. Although some weak evidence of carcinogenicity has been reported in animals, when all of the data are considered, the weight of evidence does not show that DGEBPA is carcinogenic.

3. Composition Information

This product is a substance.

Component	CAS #	Amount
Propane, 2,2-bis[p-(2,3-epoxypropoxy)phenyl]-, polymers	25085-99-8	100.0 %

4. First-aid measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Inhalation: Move person to fresh air; if effects occur, consult a physician.
Skin Contact: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.
Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist. Suitable emergency eye wash facility should be available in work area.
Ingestion: No emergency medical treatment necessary.

Most important symptoms and effects, both acute and delayed
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of immediate medical attention and special treatment needed
No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Suitable extinguishing media
Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Water fog, applied gently may be used as a blanket for fire extinguishment.

Extinguishing Media to Avoid: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Phenolics. Carbon monoxide. Carbon dioxide.
Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is emitted when burned without sufficient oxygen.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Isolate area. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection. Refer to Section 7, Handling, for additional precautionary measures.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Sand. Polypropylene fiber products. Polyethylene fiber products. Remove residual with soap and hot water. Collect in suitable and properly labeled containers. Residual can be removed with solvent. Solvents are not recommended for clean-up unless the recommended exposure guidelines and safe handling practices for the specific solvent are followed. Consult appropriate solvent Safety Data Sheet for handling information and exposure guidelines. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling
General Handling: Avoid prolonged or repeated contact with skin. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Avoid use of electric band heaters. Failures of electric band heaters have been reported to cause drums of liquid epoxy resin to explode and catch fire.

Application of a direct flame to a container of liquid epoxy resin can also cause explosion and/or fire. See Section 8, E POSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Recommended pumping and storage temperature for bulk shipments is 60°C (140°F) Additional storage and handling information on this product may be obtained by calling your sales or customer service contact. Ask for a product brochure.

Shelf life: Use within	**Storage temperature:**
24 Months	2 - 43 °C 35.6 - 109.4 °F

8. Exposure Controls / Personal Protection

Exposure Limits

None established

Personal Protection

Eye/Face Protection: Use safety glasses (with side shields).

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions, no respiratory protection should be needed; however, if material is heated or sprayed, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance	
Physical State	viscous, Liquid.
Color	Yellow
Odor	Odorless to mild
Odor Threshold	No test data available
pH	No test data available
Melting Point	Not applicable
Freezing Point	No test data available
Boiling Point (760 mmHg)	320 °C (608 °F) *Differential Scanning Calorimetry (DSC)* decomposition.

Flash Point - Closed Cup	264 - 268 °C (507 - 514 °F) *EC Method A9*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No
Flammable Limits In Air	**Lower**: Not applicable **Upper**: Not applicable
Vapor Pressure	0.0000001 Pa 25 °C *EC Method A4*
Vapor Density (air = 1)	no data available
Specific Gravity (H2O = 1)	1.16 20 °C/20 °C *Literature*
Solubility in water (by weight)	5.4 - 8.4 mg/l 20 °C *EU Method A.6 (Water Solubility)*
Partition coefficient, n-octanol/water (log Pow)	3.242 *Estimated.*
Autoignition Temperature	Not applicable
Decomposition Temperature	No test data available
Dynamic Viscosity	7,000 - 10,000 mPa.s 25 °C *ASTM D445*
Kinematic Viscosity	No test data available
Explosive properties	No
Oxidizing properties	No
Liquid Density	1.16 g/cm3 25 °C *ASTM D4052*
Molecular Weight	Not determined
Particle Size	Not applicable
Henry's Law Constant (H)	4.93E-05 Pa m3/mole.; 25 °C

10. Stability and Reactivity

Reactivity
No dangerous reaction known under conditions of normal use.

Chemical stability
Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions
Polymerization will not occur by itself. Masses of more than one pound (0.5 kg) of product plus an aliphatic amine will cause irreversible polymerization with considerable heat build-up.

Conditions to Avoid: Avoid short term exposures to temperatures above 300 °C (572 °F). Avoid prolonged exposure to temperatures above 250 °C (482 °F). Potentially violent decomposition can occur above 350 °C (662 °F). Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid.

Incompatible Materials: Avoid contact with oxidizing materials. Avoid contact with: Acids. Bases. Avoid unintended contact with amines.

Hazardous decomposition products
Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition. Uncontrolled exothermic reaction of epoxy resins release phenolics, carbon monoxide, and water.

11. Toxicological Information

Acute Toxicity
Ingestion
LD50, rat > 15,000 mg/kg
Dermal

LD50, rabbit 23,000 mg/kg

Inhalation

The LC50 has not been determined.

Eye damage/eye irritation

May cause moderate eye irritation.

Skin corrosion/irritation

Brief contact may cause moderate skin irritation with local redness.

Sensitization

Skin

Has caused allergic skin reactions in humans. Has demonstrated the potential for contact allergy in mice.

Respiratory

No relevant data found.

Repeated Dose Toxicity

Except for skin sensitization, repeated exposures to low molecular weight epoxy resins of this type are not anticipated to cause any significant adverse effects.

Chronic Toxicity and Carcinogenicity

Many studies have been conducted to assess the potential carcinogenicity of diglycidyl ether of bisphenol A (DGEBPA). Indeed, the most recent review of the available data by the International Agency for Research on Cancer (IARC) has concluded that DGEBPA is not classified as a carcinogen. Although some weak evidence of carcinogenicity has been reported in animals, when all of the data are considered, the weight of evidence does not show that DGEBPA is carcinogenic.

Developmental Toxicity

Resins based on the diglycidyl ether of bisphenol A (DGEBPA) did not cause birth defects or other adverse effects on the fetus when pregnant rabbits were exposed by skin contact, the most likely route of exposure, or when pregnant rats or rabbits were exposed orally.

Reproductive Toxicity

In animal studies, did not interfere with reproduction.

Genetic Toxicology

In vitro genetic toxicity studies were negative in some cases and positive in other cases. Animal genetic toxicity studies were negative.

12. Ecological Information

Toxicity

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 h: 2 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, Daphnia magna (Water flea), static test, 48 h, immobilization: 1.8 mg/l

Aquatic Plant Toxicity

ErC50, Scenedesmus capricornutum (fresh water algae), static test, Growth rate inhibition, 72 h: 11 mg/l

Toxicity to Micro-organisms

IC50; Bacteria, 18 h: > 42.6 mg/l

Aquatic Invertebrates Chronic Toxicity Value

Daphnia magna (Water flea), semi-static test, 21 d, number of offspring, NOEC: 0.3 mg/l

Persistence and Degradability

Based on stringent OECD test guidelines, this material cannot be considered as readily biodegradable; however, these results do not necessarily mean that the material is not biodegradable under environmental conditions.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
12 %	28 d	OECD 302B Test	Not applicable

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
6.69E-11 cm3/s	1.92 h	Estimated.

Theoretical Oxygen Demand: 2.35 mg/mg

Bioaccumulative potential

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient, n-octanol/water (log Pow): 3.242 Estimated.

Mobility in soil

Mobility in soil: Potential for mobility in soil is low (Koc between 500 and 2000)., Given its very low Henry s constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient, soil organic carbon/water (Koc): 1,800 - 4,400 Estimated.
Henry's Law Constant (H): 4.93E-05 Pa m3/mole.; 25 °C

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

14. Transport Information

DOT Non-Bulk

NOT REGULATED

DOT Bulk

NOT REGULATED

IMDG

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S
Technical Name: Epoxy resin
Hazard Class: 9 **ID Number:** UN 3082 **Packing Group:** PG III
EMS Number: F-A,S-F
Marine pollutant: Yes

ICAO/IATA

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: Epoxy resin
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III
Cargo Packing Instruction: 964
Passenger Packing Instruction: 964

Additional Information

MARINE POLLUTANT (epoxy resin)

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

Remarks:

Liquid Epoxy Resins (LERs) are made by reacting bisphenol A and epichlorohydrin. Dow uses both CAS No. 25085-99-8 and 25068-38-6 for its LERs. Other manufacturers use CAS No. 25068-38-6 for their LERs. Accordingly, LER manufacturers consider that derivatives of LERs may be described using either CAS number as a starting material.

16. Other Information

Product Literature

Additional information on this product may be obtained by calling your sales or customer service contact. Ask for a product brochure. Additional information on this and other products may be obtained by visiting our web page.

Hazard Rating System

NFPA	Health	Fire	Reactivity
	1	1	2

Recommended Uses and Restrictions

Identified uses

Used in applications such as: Adhesives. Casting. Tooling. Civil engineering. Composites. Automotive coatings. Can coatings. Coil coatings. Marine and protective coatings. Photocure industrial coating. Potting and encapsulation.

Revision

Identification Number: 79629 / 0000 / Issue Date 06/16/2014 / Version: 5.2
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200)

SECTION 1: Identification

Product Identifier	**No. 2 Diesel Fuel**
Other means of identification	2DSL ULS (All Grades); 2DSL HS (All Grades); 2DSL LS (All Grades); CARB DSL (All Grades); DIST CARB-Diesel (All Grades); Distillate,Diesel (All Grades); Gas Oil (All Grades); Hydrodewaxer Diesel (All Grades); Diesel Fuel (All Grades); EPA Diesel Fuel (All Grades); No. 2 Diesel (All Grades); No. 2 Diesel Fuel Oil (All Grades); No. 2 Distillate; No. 2 Diesel with Renewable Diesel (All Grades); Super Diesel Fuel (All Grades); Distillate Blend Stock; Fuels, Diesel; Virgin Diesel Fuel; PCR - HOD – Heating Oil Distillate; Diesel, Dyed and Undyed
SDS Number	**001847**
MARPOL Annex I Category	Gas Oils, Including Ship s Bunkers
Relevant identified uses	Fuel
Uses advised against	All others
24 Hour Emergency Phone Number	CHEMTREC 1-800-424-9300 CHEMTREC Mexico 01-800-681-9531

Manufacturer/Supplier	**SDS Information**
Phillips 66 Company P.O. Box 4428 Houston, Texas 77210	Phone: 800-762-0942 Email: SDS P66.com URL: www.Phillips66.com

SECTION 2: Hazard identification

Classified Hazards

H226 - Flammable liquids -- Category 3
H315 -- Skin corrosion/irritation -- Category 2
H304 -- Aspiration Hazard -- Category 1
H332 -- Acute toxicity, Inhalation -- Category 4
H373 -- Specific target organ toxicity (repeated exposure) -- Category 2
H351 -- Carcinogenicity -- Category 2
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2

Hazards Not Otherwise Classified (HNOC)

PHNOC: Electrostatic charge may be generated during pumping and other operations

HHNOC: None known

Label Elements

DANGER

Flammable liquid and vapor
Causes skin irritation
May be fatal if swallowed and enters airways
Harmful if inhaled
May cause damage to organs through prolonged or repeated exposure
Suspected of causing cancer
Toxic to aquatic life with long lasting effects

Obtain special instructions before use; Do not handle until all safety precautions have been read and understood; Keep away from heat/sparks/open flames/hot surfaces. - No smoking; Ground/bond container and receiving equipment; Use only non-sparking tools; Take precautionary measures against static discharge; Do not breathe dust/fume/gas/mist/vapours/spray; Wash skin thoroughly after handling; Use only outdoors or in a well-ventilated area; Avoid release to the environment; Wear protective gloves/protective clothing and eye/face protection; IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician; Do NOT induce vomiting; IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower; IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing; Call a POISON CENTER or doctor/physician if you feel unwell; Take off contaminated clothing and wash before reuse; In case of fire: Use CO2, dry chemical, or foam for extinction; Store in a well-ventilated place. Keep cool; Dispose of contents/container to an approved waste disposal plant

SECTION 3: Composition/information on ingredients

Chemical Name	CASRN	Concentration[1]
Fuels, diesel, no. 2	68476-34-6	95-100
Naphthalene	91-20-3	1

All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4: First aid measures

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing, and flush affected area(s) with large amounts of water. If skin surface is damaged, apply a clean dressing and seek medical attention. If skin surface is not damaged, cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops, seek medical attention. Wash contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician. (see Note to Physician)

Inhalation: If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion: Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

Most important symptoms and effects, both acute and delayed: While significant vapor concentrations are not likely, high concentrations can cause minor respiratory irritation, headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue. Ingestion can cause irritation of the digestive tract, nausea, diarrhea, and vomiting. Prolonged or repeated contact may dry skin and cause irritation.

Notes to Physician: When using high-pressure equipment, injection of product under the skin can occur. In this case, the casualty should be sent immediately to the hospital. Do not wait for symptoms to develop. High-pressure hydrocarbon injection injuries may produce substantial necrosis of underlying tissue despite an innocuous appearing external wound. These injuries often require extensive emergency surgical debridement and all injuries should be evaluated by a specialist in order to assess the extent of injury. Early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

SECTION 5: Firefighting measures

NFPA 704 Hazard Class

Health: 1 **Flammability:** 2 **Instability:** 0

0 (Minimal)
1 (Slight)
2 (Moderate)
3 (Serious)
4 (Severe)

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Specific hazards arising from the chemical

Unusual Fire & Explosion Hazards: Flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones,

computers, calculators, and pagers which have not been certified as intrinsically safe) Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

Special protective actions for fire-fighters: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: Flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop and contain spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802).

Methods and material for containment and cleaning up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

SECTION 7: Handling and storage

Precautions for safe handling: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Use only non-sparking tools. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe vapor or mist. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8). Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

High pressure injection of hydrocarbon fuels, hydraulic oils or greases under the skin may have serious consequences even though no symptoms or injury may be apparent. This can happen accidentally when using high pressure equipment such as high pressure grease guns, fuel injection apparatus or from pinhole leaks in tubing of high pressure hydraulic oil equipment.

For use as a motor fuel only. Do not use as a solvent due to its flammable and potentially toxic properties. Siphoning by mouth can result in lung aspiration which can be harmful or fatal.

The use of hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

Diesel engine exhaust contains hazardous combustion products and has been identified as a cancer hazard. Exposure should be minimized to reduce potential risk.

Static Accumulation Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding of tanks, transfer piping, and storage tank level floats are necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. Special care should be given to ensure that special slow load procedures for "switch loading" are followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha). For more information, refer to OSHA Standard 29 CFR 1910.106, Flammable and Combustible Liquids , National Fire Protection Association (NFPA 77, Recommended Practice on Static Electricity , and/or the American Petroleum Institute (API) Recommended Practice 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents .

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

SECTION 8: Exposure controls/personal protection

Chemical Name	ACGIH	OSHA	Phillips 66
Fuels, diesel, no. 2	TWA: 100 mg/m^3 inhalable fraction and vapor Skin	---	---
Naphthalene	TWA: 10 ppm Skin	TWA: 10 ppm TWA: 50 mg/m^3 Carcinogen	0.2 ppm TWA8hr

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and use conditions, additional protection may be necessary to prevent skin contact including use of items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator s use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer s instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Other Protective Equipment: Eye wash and quick-drench shower facilities should be available in the work area. Thoroughly

clean shoes and wash contaminated clothing before reuse.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

SECTION 9: Physical and chemical properties

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance: Straw colored to dyed red
Physical Form: Liquid
Odor: Diesel fuel
Odor Threshold: No data
pH: Not applicable
Vapor Density (air=1): > 3
Upper Explosive Limits (vol % in air): 10.0
Lower Explosive Limits (vol % in air): 0.3
Evaporation Rate (nBuAc=1): 1
Particle Size: Not applicable
Percent Volatile: Negligible ambient conditions
Flammability (solid, gas): Not applicable

Flash Point: 125 - 180 °F / 52 - 82 °C
Test Method: Pensky-Martens Closed Cup (PMCC), ASTM D93, EPA 1010
Initial Boiling Point/Range: 300 - 690 °F / 149 - 366 °C
Vapor Pressure: 0.40 mm Hg
Partition Coefficient (n-octanol/water) (Kow): No data
Melting/Freezing Point: No data
Auto-ignition Temperature: 500 °F / 260 °C
Decomposition Temperature: No data
Specific Gravity (water=1): 0.81-0.88 60 F (15.6 C)
Bulk Density: 7.08 lbs/gal
Viscosity: No data
Solubility in Water: Negligible

SECTION 10: Stability and reactivity

Reactivity: Not chemically reactive.

Chemical stability: Stable under normal ambient and anticipated conditions of use.

Possibility of hazardous reactions: Hazardous reactions not anticipated.

Conditions to avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Incompatible materials: Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous decomposition products: Not anticipated under normal conditions of use.

SECTION 11: Toxicological information

Information on Toxicological Effects

Substance / Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Harmful if inhaled		4.65 mg/L (mist)
Dermal	Unlikely to be harmful		>2 g/kg
Oral	Unlikely to be harmful		> 5 g/kg

Aspiration Hazard: May be fatal if swallowed and enters airways

Skin Corrosion/Irritation: Causes skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Skin Sensitization: Not expected to be a skin sensitizer.

Respiratory Sensitization: Not expected to be a respiratory sensitizer.

Specific Target Organ Toxicity (Single Exposure): Not expected to cause organ effects from single exposure.

Specific Target Organ Toxicity (Repeated Exposure): May cause damage to organs through prolonged or repeated

exposure. Repeated dermal application of petroleum gas oils for 90 days resulted in decreased liver, thymus, and spleen weights, and altered bone marrow function. Microscopic alterations included liver hypertrophy and necrosis, decreased hematopoesis and lymphocyte depletion.

Carcinogenicity: Suspected of causing cancer. Petroleum middle distillates have been shown to cause skin tumors in mice following repeated and prolonged skin contact. Follow-up studies have shown that these tumors are produced through a non-genotoxic mechanism associated with frequent cell damage and repair, and that they are not likely to cause tumors in the absence of prolonged skin irritation.

Germ Cell Mutagenicity: Not expected to cause heritable genetic effects.

Reproductive Toxicity: Not expected to cause reproductive toxicity.

Other Comments: Diesel engine exhaust has been classified by the International Agency for Research on Cancer (IARC) and National Toxicology Program (NTP) as a carcinogen.

Information on Toxicological Effects of Components

Naphthalene

Carcinogenicity: Naphthalene has been evaluated in two year inhalation studies in both rats and mice. The US National Toxicology Program (NTP) concluded that there is clear evidence of carcinogenicity in male and female rats based on increased incidences of respiratory epithelial adenomas and olfactory epithelial neuroblastomas of the nose. NTP found some evidence of carcinogenicity in female mice (alveolar adenomas) and no evidence of carcinogenicity in male mice. Naphthalene has been identified as a carcinogen by IARC and NTP.

SECTION 12: Ecological information

GHS Classification:
H411 -- Hazardous to the aquatic environment, chronic toxicity -- Category 2
Toxic to aquatic life with long lasting effects.

Toxicity: Experimental studies of gas oils show that acute aquatic toxicity values are typically in the range 2-20 mg/L. These values are consistent with the predicted aquatic toxicity of these substances based on their hydrocarbon compositions. They should be regarded as toxic to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment.

Persistence and Degradability: Gas oils are complex combinations of individual hydrocarbon species. Based on the known or expected properties of individual constituents, category members are not predicted to be readily biodegradable. Some hydrocarbon constituents of gas oils are predicted to meet the criteria for persistence; on the other hand, some components can be easily degraded by microorganisms under aerobic conditions.

Persistence per IOPC Fund definition: Non-Persistent

Bioaccumulative Potential: Gas oil components have measured or calculated Log Kow values in the range of 3.9 to 6 which indicates a high potential to bioaccumulate. Lower molecular weight compounds are readily metabolized and the actual bioaccumulation potential of higher molecular weight compounds is limited by the low water solubility and large molecular size.

Mobility in Soil: Releases to water will result in a hydrocarbon film floating and spreading on the surface. For the lighter components, volatilization is an important loss process and reduces the hazard to aquatic organisms. In air, the hydrocarbon vapors react readily with hydroxyl radicals with half-lives of less than one day. Photoxidation on the water surface is also a significant loss process particularly for polycyclic aromatic compounds. In water, the majority of components will be adsorbed on sediment. Adsorption is the most predominant physical process on release to soil. Adsorbed hydrocarbons will slowly degrade in both water and soil.

Other adverse effects: None anticipated.

SECTION 13: Disposal considerations

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations. This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the SDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)
• D001 - Ignitability characteristic

SECTION 14: Transport information

U.S. Department of Transportation (DOT)
UN Number: UN1202
UN proper shipping name: Diesel fuel
Transport hazard class(es): 3 *or* Combustible liquid
Packing Group: III
Environmental Hazards: Marine pollutant - Environmentally Hazardous
Special precautions for user: *Combustible liquid classification is dependent on a flash point of >60° C (140° F) and <93° C (200° F).*
NA1993 may be used instead of UN1202 for domestic land transportation.
If transported in bulk by marine vessel in international waters, product is being carried under the scope of MARPOL Annex I.
Container(s) greater than 5 liters (liquids) or 5 kilograms (solids), shipped by water mode and ALL bulk shipments may require the shipping description to contain the "Marine Pollutant" notation [49 CFR 172.203(l)] and the container(s) to display the [Marine Pollutant Mark] [49 CFR 172.322].
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15: Regulatory information

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health Hazard:	Yes
Chronic Health Hazard:	Yes
Fire Hazard:	Yes
Pressure Hazard:	No
Reactive Hazard:	No

CERCLA/SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Chemical Name	Concentration[1]	de minimis
Naphthalene	1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):
EPA s Petroleum Exclusion applies to this material - (CERCLA 101(14)).

California Proposition 65:
Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Chemical Name	Type of Toxicity
Naphthalene	Cancer

Diesel engine exhaust is on the Proposition 65 list of chemicals known to the State of California to cause cancer.

International Hazard Classification

Canada:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by the Regulations.

International Inventories
All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.

All components are either on the DSL, or are exempt from DSL listing requirements.

U.S. Export Control Classification Number: EAR99

SECTION 16: Other information

Issue Date:	Previous Issue Date:	SDS Number	Status:
27-Jul-2016	27-Jul-2016	001847	FINAL

Revised Sections or Basis for Revision:
Product Name / Synonyms (Section 1)

Guide to Abbreviations:
ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)

Disclaimer of Expressed and implied Warranties:
The information presented in this Safety Data Sheet is based on data believed to be accurate as of the date this Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS E PRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

Safety Data Sheet
DIESTONE DLS SATWIPES PROSAT SOCOSAT - P29003A

Safety Data Sheet dated 6/8/2016, version 3

1. IDENTIFICATION

Product identifier

Mixture identification:

Trade name: DIESTONE DLS SATWIPES PROSAT SOCOSAT

Other means of identification:

MSDS code: P29003A

Recommended use of the chemical and restrictions on use

Recommended use:

Solvent

Cleaner

Industrial uses

Professional uses

Restrictions on use:

No uses advised against are identified.

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Company:

SOCOMORE S.A.S.

Zone Industrielle du Prat - CS 23707 - 56037 VANNES CEDEX - France

Tel : +33 (0)2 97 43 76 83 - Fax : +33 (0)2 97 54 20 26

Distributor: Dysol Inc. - 2901 Shamrock Ave. - Forth Worth, TX 76107 / Phone: 1-817-335-1826 / csr-na@socomore.com/ Fax Number: 817-335-2405

Distributor: Socomore Ltd - 5, Coe Avenue - Loughborough - Leicestershire - LE11 4SE - UK - Tel: +44 1509 262040 - Fax: +44 1509 262046

Distributor: Socomore Iberia - Calle Diputació, 260 - 08007 Barcelona - Espana - Tel: +34 917 693 962 - Fax: +34 902 908 966

Distributor: MagChem Inc. 1271, rue Ampère, suite 101, Boucherville, QC, J4B 5Z5 Canada - Tel: 1-450 641 8500 - Fax: 1-450 655 1717

Distributor: Socomore GmbH - c/o MAZARS GmbH - Bernhard-Wicki-Straße 7 - 80636 München - Deutschland - Tel: +49 (0)89 20 70 28 83 - Fax: +49 (0) 89 88 91 98 16

Distributor: Socomore Trading Shangai - 355 East Kang Qiao Road - Kang Qiao Industrial Zone - Pudong - 201315 Shangai - Tel: 862158131133 - Fax: 862158131933

Dystrybutor : SOCOMORE SPzoo - Ul. Piekna 18, 00-549 Warszawa Polska - Tel : +48 (22) 486 084 41 14 - Fax : +48 (22) 621 61 09

Distributor/Manufacturer: Socomore Ireland Ltd. - Meenane, Watergrasshill, Co. Cork, Ireland - Tel +353 21 4889922 / Fax +353 21 4889923 / ireland@socomore.com

Competent person responsible for the safety data sheet:

techdirsocomore@socomore.com

Emergency phone number

CHEMTEL: 1-800-255-3924 (USA) / CANUTEC: 1-613-996-6666 (CANADA)

2. HAZARD(S) IDENTIFICATION

Classification of the chemical

- Warning, Flam. Liq. 3, Flammable liquid and vapour.
- Warning, STOT SE 3, May cause drowsiness or dizziness.

Label elements

The product is not classified as dangerous according to OSHA Hazard Communication Standard (29 CFR 1910.1200).

Hazard pictograms:

Warning

Hazard statements:

H226 Flammable liquid and vapour.
H336 May cause drowsiness or dizziness.

Precautionary statements:

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing vapours.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves and eye/face protection.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTER/doctor/... if you feel unwell.
P370+P378 In case of fire, use a CO2 fire extinguisher to extinguish.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/container in accordance with applicable regulations.

Special Provisions:

None

Hazards not otherwise classified identified during the classification process:

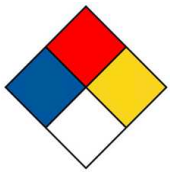
None

Ingredient(s) with unknown acute toxicity:

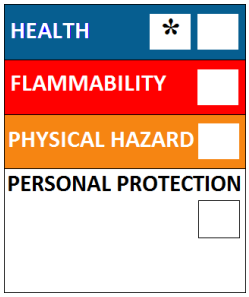
None.

Additional classification information

NFPA rating:



HMIS rating:



3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances

N.A.

Mixtures

Hazardous components within the meaning of 29 CFR 1910.1200 and related classification:

>= 50% - < 60% 1-methoxy-2-propanol; monopropylene glycol methyl ether

REACH No.: 01-2119457435-35, Index number: 603-064-00-3, CAS: 107-98-2, EC: 203-539-1

B.6/3 Flam. Liq. 3 H226

A.8/3 STOT SE 3 H336

>= 5% - < 7% HYDROCARBONS, C9-C11, N-ALKANES, ISOALKANES, CYCLICS, <2% AROMATICS

REACH No.: 01-2119463258-33, EC: 919-857-5

B.6/3 Flam. Liq. 3 H226

A.10/1 Asp. Tox. 1 H304

A.8/3 STOT SE 3 H336

4. FIRST-AID MEASURES

Description of necessary measures

In case of skin contact:

Immediately take off all contaminated clothing.

Remove contaminated clothing immediately and dispose off safely.

In case of eyes contact:

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

In case of Ingestion:

Do not induce vomiting. Obtain a medical examination.

In case of Inhalation:

Remove casualty to fresh air and keep warm and at rest.

Most important symptoms/effects, acute and delayed

None

Indication of immediate medical attention and special treatment needed

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

Treatment:

No particular treatment.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:

In case of fire, use a CO2 fire extinguisher to extinguish.

Unsuitable extinguishing media:

None in particular.

Specific hazards arising from the chemical

Do not inhale explosion and combustion gases.

Burning produces heavy smoke.

Hazardous combustion products:

None

Explosive properties: N.A.

Oxidizing properties: N.A.

Special protective equipment and precautions for fire-fighters

Use suitable breathing apparatus .

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Move undamaged containers from immediate hazard area if it can be done safely.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment, and emergency procedures

Wear personal protection equipment.

Remove all sources of ignition.

Wear breathing apparatus if exposed to vapours/dusts/aerosols.

Provide adequate ventilation.

Remove persons to safety.

Use appropriate respiratory protection.

See protective measures under point 7 and 8.

Methods and materials for containment and cleaning up

Wash with plenty of water.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with skin and eyes, inhalation of vapours and mists.

Do not use on extensive surface areas in premises where there are occupants.

Don't use empty container before they have been cleaned.

Before making transfer operations, assure that there aren't any incompatible material residuals in the containers.

Contamined clothing should be changed before entering eating areas.
Do not eat or drink while working.
See also section 8 for recommended protective equipment.

Conditions for safe storage, including any incompatibilities

Always keep in a well ventilated place.
Keep away from unguarded flame, sparks, and heat sources. Avoid direct exposure to sunlight.
Avoid accumulating electrostatic charge.
Keep away from food, drink and feed.
Incompatible materials:
None in particular.
Instructions as regards storage premises:
Cool and adequately ventilated.
Safety electric system.
Storage temperature:
Store at ambient temperature.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

1-methoxy-2-propanol; monopropylene glycol methyl ether - CAS: 107-98-2

- OEL Type: National - LTE(8h): 188 mg/m3, 50 ppm - STE: 375 mg/m3, 100 ppm - Notes: FRENCH-INRS- TMP N°84
- OEL Type: National - LTE: 370 mg/m3, 100 ppm - Notes: GERMAN
- OEL Type: EU - LTE(8h): 375 mg/m3, 100 ppm - STE: 563 mg/m3, 150 ppm - Notes: Bold-type: Indicative Occupational Exposure Limit Values [2,3] and Limit Values for Occupational Exposure [4] (for references see bibliography)
- OEL Type: ACGIH - LTE(8h): 50 ppm - STE: 100 ppm - Notes: A4 - Eye and URT irr

DNEL Exposure Limit Values

N.A.

PNEC Exposure Limit Values

N.A.

Appropriate engineering controls:

None

Individual protection measures

Eye protection:

Safety goggles (EN 166)

Protection for skin:

Use clothing that provides comprehensive protection to the skin, e.g. cotton, rubber, PVC or viton.

Protection for hands:

Suitable gloves type: NF EN374
Butyl caoutchouc (butyl rubber).

Respiratory protection:

Use adequate protective respiratory equipment.
Filtering Half-face mask (NF EN 149), class FFP1
Mask with filter "A1" , brown colour (NF EN14387)

Thermal Hazards:

None

9. PHYSICAL AND CHEMICAL PROPERTIES

Properties	Value	Method:	Notes
Appearance and colour:	SOLID	--	--
Odour:	N.A.	--	--
Odour threshold:	N.A.	--	--
pH:	N.A.	--	--
Melting point / freezing point:	Not Relevant	--	--
Initial boiling point and boiling range:	117 °C	--	--
Flash Point:	--	--	--
Evaporation rate:	0.6	--	--
Solid/gas flammability:	N.A.	--	--
Upper/lower flammability or explosive limits:	N.A.	--	--
Vapour pressure:	6,8 mmHg (20°C)	--	--
Vapour density:	3.4	--	--
Relative density:	< 1	--	--
Solubility in water:	N.A.	--	--
Solubility in oil:	N.A.	--	--
Partition coefficient (n-octanol/water):	N.A.	--	--
Auto-ignition temperature:	276°C	--	--
Decomposition temperature:	N.A.	--	--

Viscosity:	N.A.	--	--
Explosive properties:	N.A.	--	--
Oxidizing properties:	N.A.	--	--

9.2. Other information

Properties	**Value**	**Method:**	**Notes**
Miscibility:	N.A.	--	--
Fat Solubility:	N.A.	--	--
Conductivity:	N.A.	--	--
Substance Groups relevant properties	N.A.	--	--

10. STABILITY AND REACTIVITY

Reactivity

It may generate dangerous reactions (See subsections below)

Chemical stability

It may generate dangerous reactions (See subsections below)

Possibility of hazardous reactions

None

Conditions to avoid

Avoid accumulating electrostatic charge.

Incompatible materials

Avoid contact with combustible materials. The product could catch fire.

Hazardous decomposition products

None.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Toxicological information of the mixture:

N.A.

Toxicological information of the main substances found in the mixture:

HYDROCARBONS, C9-C11, N-ALKANES, ISOALKANES, CYCLICS, <2% AROMATICS

a) acute toxicity:

Test: LD50 - Route: Oral - Species: Rat > 5000 mg/kg

Test: LD50 - Route: Skin - Species: Rabbit > 5000 mg/kg

Test: LC50 - Route: Inhalation - Species: Rat > 4951 mg/m3

Substance(s) listed on the NTP report on Carcinogens:

None.

Substance(s) listed on the IARC Monographs:

None.

Substance(s) listed as OSHA Carcinogen(s):

None.

Substance(s) listed as NIOSH Carcinogen(s):

None.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Adopt good working practices, so that the product is not released into the environment.

HYDROCARBONS, C9-C11, N-ALKANES, ISOALKANES, CYCLICS, <2% AROMATICS

a) Aquatic acute toxicity:

Endpoint: LC50 - Species: Fish > 1000 mg/l - Duration h: 96 - Notes: Oncorhynchus mykiss

Endpoint: EC50 - Species: Algae > 1000 mg/l - Duration h: 72 - Notes: Pseudokirchnerella subcapitata

Persistence and degradability

N.A.

Bioaccumulative potential

N.A.

Mobility in soil

N.A.

Other adverse effects

No harmful effects expected.

13. DISPOSAL CONSIDERATIONS

Waste treatment and disposal methods

Recover, if possible. Send to authorised disposal plants or for incineration under controlled conditions. In so doing, comply with the local and national regulations currently in force.

14. TRANSPORT INFORMATION

UN number

ADR-UN Number:	3175
DOT number:	UN3175
IATA-UN Number:	3175
IMDG-UN Number:	3175

UN proper shipping name

ADR-Shipping Name:	SOLIDS or mixtures of solids (such as preparations and wastes) CONTAINING FLAMMABLE LIQUID, N.O.S. having a

flash-point up to 60 °C (1-methoxy-2-propanol; monopropylene glycol methyl ether, 2-methoxy-1-methylethyl acetate)

DOT-Shipping Name:	SOLIDS or mixtures of solids (such as preparations and wastes) CONTAINING FLAMMABLE LIQUID, N.O.S. having a flash-point up to 60 °C (1-methoxy-2-propanol; monopropylene glycol methyl ether, 2-methoxy-1-methylethyl acetate)
IATA-Shipping Name:	SOLIDS or mixtures of solids (such as preparations and wastes) CONTAINING FLAMMABLE LIQUID, N.O.S. having a flash-point up to 60 °C (1-methoxy-2-propanol; monopropylene glycol methyl ether, 2-methoxy-1-methylethyl acetate)
IMDG-Shipping Name:	SOLIDS or mixtures of solids (such as preparations and wastes) CONTAINING FLAMMABLE LIQUID, N.O.S. having a flash-point up to 60 °C (1-methoxy-2-propanol; monopropylene glycol methyl ether, 2-methoxy-1-methylethyl acetate)

N.A.

Transport hazard class(es)

ADR-Class:	4.1
DOT Hazard Class:	4.1
IATA-Class:	4.1
IATA-Label:	4.1
IMDG-Class:	4.1

N.A.

Packing group

ADR-Packing Group:	II
DOT Packing group:	II
IATA-Packing group:	II
IMDG-Packing group:	II

Environmental hazards

ADR-Enviromental Pollutant:	No
IMDG-Marine pollutant:	No

Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)

N.A.

Special precautions

DOT Special provisions:	47, IB6, IP2, T3, TP33
DOT Labels: 4.1	
ADR-Subsidiary risks:	-
ADR-S.P.:	216 274 601
ADR-Tunnel Restriction Code:	2 (E)
IATA-Passenger Aircraft:	445
IATA-Subsidiary risks:	-
IATA-Cargo Aircraft:	448
IATA-S.P.:	A46
IATA-ERG:	3L
IMDG-EmS:	F-A , S-I
IMDG-Subsidiary risks:	-

IMDG-Storage category: Category B
IMDG-Storage notes: -
Q.L.: 1K
Q.E.: E2

15. REGULATORY INFORMATION

USA - Federal regulations

TSCA - Toxic Substances Control Act
TSCA inventory: all the components are listed on the TSCA inventory.
TSCA listed substances:
1-methoxy-2-propanol; monopropylene glycol methyl ether is listed in TSCA Section 8b, Section 8d HSDR.

SARA - Superfund Amendments and Reauthorization Act
Section 302 – Extremely Hazardous Substances: no substances listed.
Section 304 – Hazardous substances: no substances listed.
Section 313 – Toxic chemical list: no substances listed.

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act
No substances listed.

CAA - Clean Air Act
CAA listed substances:
1-methoxy-2-propanol; monopropylene glycol methyl ether is listed in CAA Section 112(b) - HON.

CWA - Clean Water Act
CWA listed substances:
None.

USA - State specific regulations

California Proposition 65
Substance(s) listed under California Proposition 65:
None.

Massachusetts Right to know
Substance(s) listed under Massachusetts Right to know:
1-methoxy-2-propanol; monopropylene glycol methyl ether.

New Jersey Right to know
Substance(s) listed under New Jersey Right to know:
1-methoxy-2-propanol; monopropylene glycol methyl ether.

Pennsylvania Right to know
Substance(s) listed under Pennsylvania Right to know:
1-methoxy-2-propanol; monopropylene glycol methyl ether.
The following substance(s) in this product has/have an identification by CAS number either in countries not affected by the REACH regulation or in regulations not yet updated to reflect the new naming convention for hydrocarbon solvents:
HYDROCARBONS, C9-C11, N-ALKANES, ISOALKANES, CYCLICS, <2% AROMATICS (CAS: 64742-48-9)

16. OTHER INFORMATION

Full text of phrases referred to in Section 3:

H226 Flammable liquid and vapour.
H336 May cause drowsiness or dizziness.
H304 May be fatal if swallowed and enters airways.

Safety Data Sheet dated 6/8/2016, version 3
Disclaimer:
The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality. The information relates only to the specific material and may not be valid for such material used in combination with any other material or in any process.
This Safety Data Sheet cancels and replaces any preceding release.

ADR:	European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS:	Chemical Abstracts Service (division of the American Chemical Society).
CLP:	Classification, Labeling, Packaging.
DNEL:	Derived No Effect Level.
EINECS:	European Inventory of Existing Commercial Chemical Substances.
GHS:	Globally Harmonized System of Classification and Labeling of Chemicals.
HMIS:	Hazardous Materials Identification System
IARC:	International Agency for Research on Cancer
IATA:	International Air Transport Association.
IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
ICAO:	International Civil Aviation Organization.
ICAO-TI:	Technical Instructions by the "International Civil Aviation Organization" (ICAO).
IMDG:	International Maritime Code for Dangerous Goods.
INCI:	International Nomenclature of Cosmetic Ingredients.
KSt:	Explosion coefficient.
LC50:	Lethal concentration, for 50 percent of test population.
LD50:	Lethal dose, for 50 percent of test population.
LTE:	Long-term exposure.
NFPA:	National Fire Protection Association
NIOSH:	National Institute for Occupational Safety and Health
NTP:	National Toxicology Program
OSHA:	Occupational Safety and Health Administration
PNEC:	Predicted No Effect Concentration.
RID:	Regulation Concerning the International Transport of Dangerous Goods by Rail.
STE:	Short-term exposure.
STEL:	Short Term Exposure limit.
STOT:	Specific Target Organ Toxicity.
TLV:	Threshold Limiting Value.

TWATLV: Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).

SAFETY DATA SHEET

DOW CORNING(R) 7091 ADHESIVE SEALANT BLACK

Version	Revision Date:	SDS Number:	Date of last issue: 09/23/2015
3.1	11/23/2015	935778-00006	Date of first issue: 12/11/2014

SECTION 1. IDENTIFICATION

Product name : DOW CORNING(R) 7091 ADHESIVE SEALANT BLACK

Product code : 000000000001781081

Manufacturer or supplier's details

Company name of supplier : Dow Corning Corporation

Address : South Saginaw Road
Midland Michigan 48686

Telephone : (989) 496-6000

Emergency telephone : 24 Hour Emergency Telephone : (989) 496-5900
CHEMTREC : (800) 424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Adhesive, binding agents

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Reproductive toxicity : Category 2

GHS label elements

Hazard pictograms :

Signal Word : Warning

Hazard Statements : H361 Suspected of damaging fertility or the unborn child.

Precautionary Statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
Storage:
P405 Store locked up.
Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Silicone elastomer

Hazardous ingredients

Chemical name	CAS-No.	Concentration (% w/w)
Calcium carbonate	471-34-1	>= 30 - 50
Carbon black	1333-86-4	>= 1 - 5
Stearic acid	57-11-4	>= 1 - 5
Octamethylcyclotetrasiloxane	556-67-2	>= 0.1 - 1

SECTION 4. FIRST AID MEASURES

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.

If inhaled : If inhaled, remove to fresh air.
Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with soap and plenty of water.
Remove contaminated clothing and shoes.
Get medical attention.
Wash clothing before reuse.
Thoroughly clean shoes before reuse.

In case of eye contact : Flush eyes with water as a precaution.
Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.
Get medical attention.
Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed : Suspected of damaging fertility or the unborn child.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.

Notes to physician	:	Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Water spray Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Carbon oxides Metal oxides Silicon oxides Formaldehyde
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment for fire-fighters	:	In the event of fire, wear self-contained breathing apparatus. Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.
Environmental precautions	:	Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent.

Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures : See Engineering measures under E POSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation : Use only with adequate ventilation.

Advice on safe handling : Do not swallow.
Avoid contact with eyes.
Avoid prolonged or repeated contact with skin.
Handle in accordance with good industrial hygiene and safety practice.
Take care to prevent spills, waste and minimize release to the environment.

Conditions for safe storage : Keep in properly labeled containers.
Store in accordance with the particular national regulations.

Materials to avoid : Do not store with the following product types:
Strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Calcium carbonate	471-34-1	TWA (Respirable)	5 mg/m3	NIOSH REL
		TWA (total)	10 mg/m3	NIOSH REL
Carbon black	1333-86-4	TWA	3.5 mg/m3	NIOSH REL
		TWA	3.5 mg/m3	OSHA Z-1
		TWA (Inhalable fraction)	3 mg/m3	ACGIH
Stearic acid	57-11-4	TWA	10 mg/m3	ACGIH
Octamethylcyclotetrasiloxane	556-67-2	TWA	10 ppm	DCC OEL

Engineering measures : Processing may form hazardous compounds (see section 10).
Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.
Dust formation may be relevant in the processing of this product. In addition to substance-specific OELs, general limi-

tations of concentrations of particulates in the air at workplaces have to be considered in workplace risk assessment. Relevant limits include: OSHA PEL for Particulates Not Otherwise Regulated of 15 mg/m3 - total dust, 5 mg/m3 - respirable fraction; and ACGIH TWA for Particles (insoluble or poorly soluble) Not Otherwise Specified of 3 mg/m3 - respirable particles, 10 mg/m3 - inhalable particles.

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection
Material : Impervious gloves

Remarks : For prolonged or repeated contact use protective gloves. Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

Eye protection : Wear the following personal protective equipment:
Safety glasses

Skin and body protection : Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential.
Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

Hygiene measures : Ensure that eye flushing systems and safety showers are located close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.
These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	paste
Color	:	black
Odor	:	No data available
Odor Threshold	:	No data available
pH	:	Not applicable
Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	Not applicable
Flash point	:	> 100 °C Method: closed cup
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Not classified as a flammability hazard
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapor pressure	:	Not applicable
Relative vapor density	:	No data available
Relative density	:	1.39
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Use at elevated temperatures may form highly hazardous compounds. Can react with strong oxidizing agents. Methyl alcohol is formed upon contact with water or humid air. Hazardous decomposition products will be formed at elevated temperatures.
Conditions to avoid	:	None known.
Incompatible materials	:	Oxidizing agents

Hazardous decomposition products

Thermal decomposition	:	Formaldehyde

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Skin contact
Ingestion
Eye contact

Acute toxicity

Not classified based on available information.

Ingredients:

Calcium carbonate:

Acute oral toxicity	:	LD50 (Rat): > 2,000 mg/kg Method: OECD Test Guideline 420 Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	:	LC50 (Rat): > 3 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg Method: OECD Test Guideline 402 Assessment: The substance or mixture has no acute dermal toxicity

Carbon black:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 0.0046 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Stearic acid:
Acute oral toxicity : LD50: > 2,000 mg/kg
Method: OECD Test Guideline 401
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 0.1621 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Octamethylcyclotetrasiloxane:
Acute oral toxicity : LD50 (Rat): > 4,800 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Based on test data

Acute inhalation toxicity : LC50 (Rat): 2975 ppm
Exposure time: 4 h
Test atmosphere: vapor
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Based on test data

Acute dermal toxicity : LD50 (Rabbit): > 2.5 ml/kg
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: Based on test data

Skin corrosion/irritation

Not classified based on available information.

Ingredients:

Calcium carbonate:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Carbon black:
Species: Rabbit
Result: No skin irritation

Stearic acid:
Species: Rabbit
Result: No skin irritation

Octamethylcyclotetrasiloxane:
Species: Rabbit
Result: No skin irritation
Remarks: Based on test data

Serious eye damage/eye irritation

Not classified based on available information.

Ingredients:

Calcium carbonate:
Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405

Carbon black:
Species: Rabbit
Result: No eye irritation

Stearic acid:
Species: Rabbit
Result: No eye irritation

Octamethylcyclotetrasiloxane:
Species: Rabbit
Result: No eye irritation
Remarks: Based on test data

Respiratory or skin sensitization

Skin sensitization: Not classified based on available information.
Respiratory sensitization: Not classified based on available information.

Ingredients:

Calcium carbonate:
Test Type: Local lymph node assay (LLNA)
Routes of exposure: Skin contact
Species: Mouse
Method: OECD Test Guideline 429
Result: negative

Carbon black:
Test Type: Buehler Test
Routes of exposure: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Stearic acid:
Test Type: Buehler Test
Routes of exposure: Skin contact
Species: Guinea pig
Result: negative

Octamethylcyclotetrasiloxane:
Assessment: Does not cause skin sensitization.

Test Type: Maximization Test
Species: Guinea pig
Remarks: Based on test data

Germ cell mutagenicity

Not classified based on available information.

Ingredients:

Calcium carbonate:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Result: negative

Carbon black:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Stearic acid:

Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative
Remarks: Based on data from similar materials

Octamethylcyclotetrasiloxane:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Remarks: Based on test data

: Test Type: Mutagenicity (in vitro mammalian cytogenetic test)
Result: negative
Remarks: Based on test data

: Test Type: Chromosome aberration test in vitro
Result: negative
Remarks: Based on test data

: Test Type: In vitro sister chromatid exchange assay in mammalian cells
Result: negative
Remarks: Based on test data

: Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
Result: negative
Remarks: Based on test data

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (vapor)
Result: negative

Remarks: Based on test data

Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on test data

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

Carcinogenicity

Not classified based on available information.

IARC Group 2B: Possibly carcinogenic to humans

Carbon black 1333-86-4

OSHA No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Suspected of damaging fertility or the unborn child.

Ingredients:

Calcium carbonate:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Effects on fetal development : Test Type: Reproduction/Developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Stearic acid:

Effects on fertility : Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative

Effects on fetal development	:	Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: negative

Octamethylcyclotetrasiloxane:

Effects on fertility	:	Test Type: Two-generation reproduction toxicity study Species: Rat, male and female Application Route: inhalation (vapor) Symptoms: Effects on fertility. Remarks: Based on test data
Effects on fetal development	:	Test Type: Prenatal development toxicity study (teratogenicity) Species: Rabbit Application Route: inhalation (vapor) Symptoms: No effects on fetal development. Remarks: Based on test data
Reproductive toxicity - Assessment	:	Some evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT-single exposure

Not classified based on available information.

STOT-repeated exposure

Not classified based on available information.

Ingredients:

Carbon black:
Routes of exposure: inhalation (dust/mist/fume)
Assessment: No significant health effects observed in animals at concentrations of 0.2 mg/l/6h/d or less.

Octamethylcyclotetrasiloxane:
Routes of exposure: Ingestion
Assessment: No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.

Routes of exposure: inhalation (vapor)
Assessment: No significant health effects observed in animals at concentrations of 1 mg/l/6h/d or less.

Routes of exposure: Skin contact
Assessment: No significant health effects observed in animals at concentrations of 200 mg/kg bw or less.

Repeated dose toxicity

Ingredients:

Calcium carbonate:
Species: Rat

NOAEL: 1,000 mg/kg
Application Route: Ingestion
Exposure time: 6 Weeks
Method: OECD Test Guideline 422

Carbon black:
Species: Rat
NOAEL: 1 mg/m3
LOAEL: 7 mg/m3
Application Route: Inhalation
Test atmosphere: dust/mist
Exposure time: 90 d
Remarks: The substance is inextricably bound in the product and therefore does not contribute to a dust inhalation hazard.

Stearic acid:
Species: Rat
NOAEL: 1,000 mg/kg
Application Route: Ingestion
Exposure time: 42 Days
Method: OECD Test Guideline 422

Octamethylcyclotetrasiloxane:
Species: Rat
Application Route: Ingestion
Remarks: Based on test data

Species: Rat
Application Route: inhalation (vapor)
Remarks: Based on test data

Species: Rabbit
Application Route: Skin contact
Remarks: Based on test data

Aspiration toxicity

Not classified based on available information.

Further information

Ingredients:

Octamethylcyclotetrasiloxane:
Remarks: Results from a 2 year repeated vapor inhalation exposure study to rats of octamethylcyclotetrasiloxane (D4) indicate effects (benign uterine adenomas) in the uterus of female animals. This finding occurred at the highest exposure dose (700 ppm) only. Studies to date have not demonstrated if these effects occur through pathways that are relevant to humans. Repeated exposure in rats to D4 resulted in protoporphyrin accumulation in the liver. Without knowledge of the specific mechanism leading to the protoporphyrin accumulation the relevance of this finding to humans is unknown.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Ingredients:

Calcium carbonate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae	:	ErC50 (Desmodesmus subspicatus (green algae)): > 14 mg/l Exposure time: 72 h Method: OECD Test Guideline 201

Carbon black:

Toxicity to fish	:	LC0 (Danio rerio (zebra fish)): 1,000 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 5,600 mg/l Exposure time: 24 h Method: OECD Test Guideline 202
Toxicity to algae	:	NOEC (Desmodesmus subspicatus (green algae)): 10,000 mg/l Exposure time: 72 h Method: OECD Test Guideline 201

Stearic acid:

Toxicity to fish	:	LC50 (Leuciscus idus (Golden orfe)): > 10,000 mg/l Exposure time: 48 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 4.8 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: No toxicity at the limit of solubility.
Toxicity to algae	:	EC50 (Pseudokirchneriella subcapitata (green algae)): > 0.9 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: No toxicity at the limit of solubility.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): > 0.22 mg/l Exposure time: 21 d Method: OECD Test Guideline 211 Remarks: No toxicity at the limit of solubility.

Toxicity to bacteria	:	EC10 (Pseudomonas putida): 883 mg/l Exposure time: 16 h

Octamethylcyclotetrasiloxane:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): > 0.022 mg/l Exposure time: 96 h Remarks: No toxicity at the limit of solubility.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia sp.): > 0.015 mg/l Exposure time: 48 h Remarks: No toxicity at the limit of solubility.
Toxicity to algae	:	EC50: > 0.022 mg/l Exposure time: 96 h Remarks: No toxicity at the limit of solubility. NOEC: 0.022 mg/l Exposure time: 96 h Remarks: No toxicity at the limit of solubility.
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): >= 0.0044 mg/l Remarks: No toxicity at the limit of solubility.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): > 0.0079 mg/l Exposure time: 21 d Remarks: No toxicity at the limit of solubility.
Toxicity to bacteria	:	IC50: > 10,000 mg/l Method: ISO 8192
Ecotoxicology Assessment Chronic aquatic toxicity	:	May cause long lasting harmful effects to aquatic life.

Persistence and degradability

Ingredients:

Stearic acid:

Biodegradability	:	Result: Readily biodegradable. Biodegradation: 93 % Exposure time: 28 d Method: OECD Test Guideline 301B

Octamethylcyclotetrasiloxane:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 3.7 % Exposure time: 28 d Method: OECD Test Guideline 310
Stability in water	:	Degradation half life: 69.3 - 144 h (24.6 °C) pH: 7 Method: OECD Test Guideline 111

Bioaccumulative potential

Ingredients:

Stearic acid:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 238 - 288
Remarks: Based on data from similar materials

Partition coefficient: n-octanol/water : log Pow: > 5

Octamethylcyclotetrasiloxane:

Partition coefficient: n-octanol/water : log Pow: 6.48 (25.1 °C)

Mobility in soil

No data available

Other adverse effects

Ingredients:

Octamethylcyclotetrasiloxane:

Results of PBT and vPvB assessment : Remarks: Octamethylcyclotetrasiloxane (D4) meets the current REACh Annex III criteria for PBT and vPvB. In Canada, D4 has been assessed and deemed to meet the PiT criteria. However, D4 does not behave similarly to known PBT/vPvB substances. The weight of scientific evidence from field studies shows that D4 is not biomagnifying in aquatic and terrestrial food webs. D4 in air will degrade by reaction with naturally occurring hydroxyl radicals in the atmosphere. Any D4 in air that does not degrade by reaction with hydroxyl radicals is not expected to deposit from the air to water, to land, or to living organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Resource Conservation and Recovery Act (RCRA) : This product has been evaluated for RCRA characteristics and does not meet the criteria of hazardous waste if discarded in its purchased form.

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulation

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

Domestic regulation

49 CFR
Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

Ingredients	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Methanol	67-56-1	5000	
Ethylenediamine	107-15-3	5000	

: Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

Ingredients	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Ethylenediamine	107-15-3	5000	

: Calculated RQ exceeds reasonably attainable upper limit.

SARA 311/312 Hazards : Chronic Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

Calcium carbonate	471-34-1	30 - 50 %
Dimethyl siloxane, hydroxy-terminated	70131-67-8	30 - 50 %
Dimethyl siloxane, trimethylsiloxy-terminated	63148-62-9	5 - 10 %
Carbon black	1333-86-4	1 - 5 %
Methanol	67-56-1	0 - 0.1 %

New Jersey Right To Know

Calcium carbonate	471-34-1	30 - 50 %
Dimethyl siloxane, hydroxy-terminated	70131-67-8	30 - 50 %
Dimethyl siloxane, trimethylsiloxy-terminated	63148-62-9	5 - 10 %
Carbon black	1333-86-4	1 - 5 %
Stearic acid	57-11-4	1 - 5 %

California Prop. 65 WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

Methanol	67-56-1

The ingredients of this product are reported in the following inventories:

NZIoC : All ingredients listed or exempt.

REACH : All ingredients (pre-)registered or exempt.

TSCA : All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.

PICCS : All ingredients listed or exempt.

KECI : All ingredients listed, exempt or notified.

ENCS/ISHL : All components are listed on ENCS/ISHL or exempted from inventory listing.

IECSC : All ingredients listed or exempt.

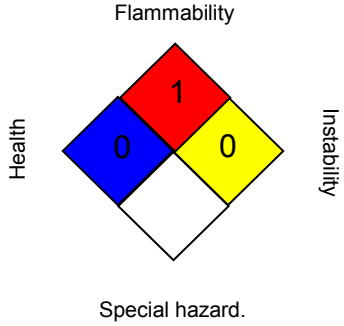
AICS : All ingredients listed or exempt.

DSL : All chemical substances in this product comply with the CEPA 1999 and NSNR and are on or exempt from listing on the Canadian Domestic Substances List (DSL).

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	0*
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, = Chronic

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
DCC OEL	:	Dow Corning Guide
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
DCC OEL / TWA	:	Time weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-1 / TWA	:	8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR -

No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/
Revision Date	:	11/23/2015

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

US / Z8

SAFETY DATA SHEET

DOW CORNING

DOW CORNING(R) 7091 ADHESIVE SEALANT GREY

Version	Revision Date:	MSDS Number:	Date of last issue: 12/11/2014
2. 0	03/16/2015	936009-00002	Date of first issue: 12/11/2014

SECTION 1. IDENTIFICATION

Product name : DOW CORNING(R) 7091 ADHESIVE SEALANT GREY

Product code : 000000000004086296

Manufacturer or supplier's details

Company name of supplier : Dow Corning Corporation

Address : South Saginaw Road
Midland Michigan 48686

Telephone : (989) 496-6000

Emergency telephone : 24 Hour Emergency Telephone : (989) 496-5900
CHEMTREC : (800) 424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Adhesive, binding agents

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Reproductive toxicity : Category 2

GHS Label element

Hazard pictograms :

Signal Word : Warning

Hazard Statements : H361 Suspected of damaging fertility or the unborn child.

Precautionary Statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
Storage:
P405 Store locked up.
Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Silicone elastomer

Hazardous ingredients

Chemical Name	CAS-No.	Concentration (%)
Calcium carbonate	471-34-1	>= 30 - < 50
Titanium dioxide	13463-67-7	>= 1 - < 5
Stearic acid	57-11-4	>= 1 - < 5
Distillates (petroleum), hydrotreated middle	64742-46-7	>= 1 - < 5
Carbon black	1333-86-4	>= 0.1 - < 1
Octamethylcyclotetrasiloxane	556-67-2	>= 0.1 - < 1

SECTION 4. FIRST AID MEASURES

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact : Wash with water and soap as a precaution.
Get medical attention if symptoms occur.

In case of eye contact : Flush eyes with water as a precaution.
Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.
Get medical attention if symptoms occur.
Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed : Suspected of damaging fertility or the unborn child.

Protection of first-aiders : No special precautions are necessary for first aid responders.

Notes to physician : Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Dry chemical

Carbon dioxide (CO2)

Unsuitable extinguishing media	:	None known.
Specific hazards during fire fighting	:	Exposure to combustion products may be a hazard to health.
Hazardous combustion products	:	Carbon oxides Metal oxides Silicon oxides Formaldehyde
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
Special protective equipment for fire-fighters	:	Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Follow safe handling advice and personal protective equipment recommendations.
Environmental precautions	:	Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation	:	Use only with adequate ventilation.
Advice on safe handling	:	Avoid prolonged or repeated contact with skin. Handle in accordance with good industrial hygiene and safety practice. Take care to prevent spills, waste and minimize release to the environment.
Conditions for safe storage	:	Keep in properly labeled containers. Store in accordance with the particular national regulations.
Materials to avoid	:	Do not store with the following product types: Strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Calcium carbonate	471-34-1	TWA (Respirable)	5 mg/m3 (Calcium carbonate)	NIOSH REL
		TWA (total)	10 mg/m3 (Calcium carbonate)	NIOSH REL
Titanium dioxide	13463-67-7	TWA (total dust)	15 mg/m3	OSHA Z-1
		TWA	10 mg/m3 (Titanium dioxide)	ACGIH
Stearic acid	57-11-4	TWA	10 mg/m3	ACGIH
Distillates (petroleum), hydrotreated middle	64742-46-7	TWA (Mist)	5 mg/m3	NIOSH REL
		ST (Mist)	10 mg/m3	NIOSH REL
		TWA (Mist)	5 mg/m3	OSHA Z-1
Carbon black	1333-86-4	TWA	3.5 mg/m3	NIOSH REL
		TWA	3.5 mg/m3	OSHA Z-1
		TWA (Inhalable fraction)	3 mg/m3	ACGIH
Octamethylcyclotetrasiloxane	556-67-2	TWA	10 ppm	DCC OEL

Engineering measures : Processing may form hazardous compounds (see section 10).
Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.
Dust formation may be relevant in the processing of this product. In addition to substance-specific OELs, general limitations of concentrations of particulates in the air at work-

places have to be considered in workplace risk assessment. Relevant limits include: OSHA PEL for Particulates Not Otherwise Regulated of 15 mg/m3 - total dust, 5 mg/m3 - respirable fraction; and ACGIH TWA for Particles (insoluble or poorly soluble) Not Otherwise Specified of 3 mg/m3 - respirable particles, 10 mg/m3 - inhalable particles.

Personal protective equipment

Respiratory protection : General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Remarks : For prolonged or repeated contact use protective gloves. Wash hands before breaks and at the end of workday.

Eye protection : Wear the following personal protective equipment: Safety glasses

Skin and body protection : Skin should be washed after contact.

Hygiene measures : Ensure that eye flushing systems and safety showers are located close to the working place.
When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.
These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : paste

Color : gray

Odor : No data available

Odor Threshold : No data available

pH : Not applicable

Melting point/freezing point	:	No data available
Initial boiling point and boiling range	:	Not applicable
Flash point	:	> 100 °C Method: Seta closed cup
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Not classified as a flammability hazard
Upper explosion limit	:	No data available
Lower explosion limit	:	No data available
Vapor pressure	:	Not applicable
Relative vapor density	:	No data available
Relative density	:	1.39
Solubility(ies)		
Water solubility	:	No data available
Partition coefficient: n-octanol/water	:	No data available
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Molecular weight	:	No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	Use at elevated temperatures may form highly hazardous compounds. Can react with strong oxidizing agents. Methyl alcohol is formed upon contact with water or humid air.

Hazardous decomposition products will be formed at elevated temperatures.

Conditions to avoid : None known.

Incompatible materials : Oxidizing agents

Hazardous decomposition products
Thermal decomposition : Formaldehyde

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Skin contact
Ingestion
Eye contact

Acute toxicity
Not classified based on available information.

Product:

Acute oral toxicity : Acute toxicity estimate: > 5,000 mg/kg
Method: Calculation method

Ingredients:

Calcium carbonate:

Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 420
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 3 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Titanium dioxide:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 6.82 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Stearic acid:

Acute oral toxicity : LD50: > 2,000 mg/kg
Method: OECD Test Guideline 401
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 0.1621 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Distillates (petroleum), hydrotreated middle:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 5,000 mg/m3
Exposure time: 4 h
Test atmosphere: vapor

Acute dermal toxicity : LD50 (Rat): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

Carbon black:

Acute oral toxicity : LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 0.0046 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Assessment: The substance or mixture has no acute inhalation toxicity

Octamethylcyclotetrasiloxane:

Acute oral toxicity : LD50 (Rat): > 4,800 mg/kg
Assessment: The substance or mixture has no acute oral toxicity
Remarks: Based on test data

Acute inhalation toxicity : LC50 (Rat): 2975 ppm
Exposure time: 4 h
Test atmosphere: vapor
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Based on test data

Acute dermal toxicity : LD50 (Rabbit): > 2.5 ml/kg
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: Based on test data

Skin corrosion/irritation

Not classified based on available information.

Ingredients:

Calcium carbonate:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Titanium dioxide:
Species: Rabbit
Result: No skin irritation

Stearic acid:
Species: Rabbit
Result: No skin irritation

Distillates (petroleum), hydrotreated middle:
Assessment: Repeated exposure may cause skin dryness or cracking.

Carbon black:
Species: Rabbit
Result: No skin irritation

Octamethylcyclotetrasiloxane:
Species: Rabbit
Result: No skin irritation
Remarks: Based on test data

Serious eye damage/eye irritation

Not classified based on available information.

Ingredients:

Calcium carbonate:
Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405

Titanium dioxide:
Species: Rabbit
Result: No eye irritation

Stearic acid:
Species: Rabbit
Result: No eye irritation

Distillates (petroleum), hydrotreated middle:
Result: No eye irritation

Carbon black:
Species: Rabbit
Result: No eye irritation

Octamethylcyclotetrasiloxane:
Species: Rabbit
Result: No eye irritation
Remarks: Based on test data

Respiratory or skin sensitization

Skin sensitization: Not classified based on available information.
Respiratory sensitization: Not classified based on available information.

Ingredients:

Calcium carbonate:
Test Type: Local lymph node assay (LLNA)
Routes of exposure: Skin contact
Species: Mouse
Method: OECD Test Guideline 429
Result: negative

Titanium dioxide:
Test Type: Local lymph node assay (LLNA)
Routes of exposure: Skin contact
Species: Mouse
Result: negative

Stearic acid:
Test Type: Buehler Test
Routes of exposure: Skin contact
Species: Guinea pig
Result: negative

Distillates (petroleum), hydrotreated middle:
Test Type: Human repeat insult patch test (HRIPT)
Routes of exposure: Skin contact
Result: negative

Carbon black:
Test Type: Buehler Test
Routes of exposure: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Octamethylcyclotetrasiloxane:
Assessment: Does not cause skin sensitization.

Test Type: Maximization Test (GPMT)
Species: Guinea pig
Remarks: Based on test data

Germ cell mutagenicity

Not classified based on available information.

Ingredients:

Calcium carbonate:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Result: negative

Titanium dioxide:
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse
Result: negative

Stearic acid:
Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative
Remarks: Based on data from similar materials

Distillates (petroleum), hydrotreated middle:
Genotoxicity in vitro : Test Type: In vitro sister chromatid exchange assay in mammalian cells
Result: negative

Carbon black:
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Octamethylcyclotetrasiloxane:
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Remarks: Based on test data

: Test Type: Mutagenicity (in vitro mammalian cytogenetic test)
Result: negative
Remarks: Based on test data

: Test Type: Chromosome aberration test in vitro
Result: negative
Remarks: Based on test data

: Test Type: In vitro sister chromatid exchange assay in mammalian cells
Result: negative
Remarks: Based on test data

: Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
Result: negative
Remarks: Based on test data

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: inhalation (vapor)
Result: negative

Remarks: Based on test data

Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on test data

Germ cell mutagenicity - Assessment : Animal testing did not show any mutagenic effects.

Carcinogenicity

Not classified based on available information.

Ingredients:

Titanium dioxide:
Species: Rat
Application Route: inhalation (dust/mist/fume)
Exposure time: 24 Months
Method: OECD Test Guideline 453
Result: positive
Remarks: The mechanism or mode of action may not be relevant in humans.
The substance is inextricably bound in the product and therefore does not contribute to a dust inhalation hazard.

Carcinogenicity - Assessment : Limited evidence of carcinogenicity in inhalation studies with animals.

Carbon black:
Species: Rat
Application Route: Inhalation
Exposure time: 2 Years
Result: positive
Target Organs: Lungs
Remarks: The substance is inextricably bound in the product and therefore does not contribute to a dust inhalation hazard.

Carcinogenicity - Assessment : Sufficient evidence of carcinogenicity in inhalation studies with animals

IARC	Group 2B: Possibly carcinogenic to humans	
	Titanium dioxide	13463-67-7
	Carbon black	1333-86-4
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.	
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.	

Reproductive toxicity

Suspected of damaging fertility or the unborn child.

Ingredients:

Calcium carbonate:

Effects on fertility	:	Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: negative
Effects on fetal development	:	Test Type: Reproduction/Developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: negative

Stearic acid:

Effects on fertility	:	Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: negative
Effects on fetal development	:	Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test Species: Rat Application Route: Ingestion Method: OECD Test Guideline 422 Result: negative

Octamethylcyclotetrasiloxane:

Effects on fertility	:	Test Type: Two-generation reproduction toxicity study Species: Rat, male and female Application Route: inhalation (vapor) Symptoms: Effects on fertility. Remarks: Based on test data
Effects on fetal development	:	Test Type: Prenatal development toxicity study (teratogenicity) Species: Rabbit Application Route: inhalation (vapor) Symptoms: No effects on fetal development. Remarks: Based on test data
Reproductive toxicity - Assessment	:	Some evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT-single exposure

Not classified based on available information.

STOT-repeated exposure

Not classified based on available information.

Ingredients:

Carbon black:
Routes of exposure: inhalation (dust/mist/fume)
Assessment: No significant health effects observed in animals at concentrations of 0.2 mg/l/6h/d or less.

Octamethylcyclotetrasiloxane:
Routes of exposure: Ingestion
Assessment: No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.

Routes of exposure: inhalation (vapor)
Assessment: No significant health effects observed in animals at concentrations of 1 mg/l/6h/d or less.

Routes of exposure: Skin contact
Assessment: No significant health effects observed in animals at concentrations of 200 mg/kg bw or less.

Repeated dose toxicity

Ingredients:

Calcium carbonate:
Species: Rat
NOAEL: 1,000 mg/kg
Application Route: Ingestion
Exposure time: 6 w
Method: OECD Test Guideline 422

Titanium dioxide:
Species: Rat
NOAEL: 24,000 mg/kg
Application Route: Ingestion
Exposure time: 28 d

Species: Rat
NOAEL: 10 mg/m3
Application Route: inhalation (dust/mist/fume)
Exposure time: 2 y
Remarks: The substance is inextricably bound in the product and therefore does not contribute to a dust inhalation hazard.

Stearic acid:
Species: Rat
NOAEL: 1,000 mg/kg
Application Route: Ingestion
Exposure time: 42 d

Method: OECD Test Guideline 422

Carbon black:
Species: Rat
NOAEL: 1 mg/m3
LOAEL: 7 mg/m3
Application Route: Inhalation
Test atmosphere: dust/mist
Exposure time: 90 d
Remarks: The substance is inextricably bound in the product and therefore does not contribute to a dust inhalation hazard.

Octamethylcyclotetrasiloxane:
Species: Rat
Application Route: Ingestion
Remarks: Based on test data

Species: Rat
Application Route: inhalation (vapor)
Remarks: Based on test data

Species: Rabbit
Application Route: Skin contact
Remarks: Based on test data

Aspiration toxicity

Not classified based on available information.

Ingredients:

Distillates (petroleum), hydrotreated middle:
The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

Further information

Ingredients:

Octamethylcyclotetrasiloxane:
Remarks: Results from a 2 year repeated vapor inhalation exposure study to rats of octamethylcyclotetrasiloxane (D4) indicate effects (benign uterine adenomas) in the uterus of female animals. This finding occurred at the highest exposure dose (700 ppm) only. Studies to date have not demonstrated if these effects occur through pathways that are relevant to humans. Based on the available information on its potential to cause harm to human health, Health Canada, in a 2008 screening assessment, has concluded that octamethylcyclotetrasiloxane is not entering the environment in a quantity or concentration or under conditions that constitute or may constitute a danger in Canada to human life or health (http://www.ec.gc.ca/ese-ees/default.asp?lang=En&n=2481B508-1). Repeated exposure in rats to D4 resulted in protoporphyrin accumulation in the liver. Without knowledge of the specific mechanism leading to the protoporphyrin accumulation the relevance of this finding to humans is unknown.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Ingredients:

Calcium carbonate:

Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae	: ErC50 (Desmodesmus subspicatus (green algae)): > 14 mg/l Exposure time: 72 h Method: OECD Test Guideline 201

Titanium dioxide:

Toxicity to fish	: LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h
Toxicity to algae	: EC50 (Skeletonema costatum (marine diatom)): > 10,000 mg/l Exposure time: 72 h
Toxicity to bacteria	: EC50: > 1,000 mg/l Exposure time: 3 h Method: OECD Test Guideline 209

Stearic acid:

Toxicity to fish	: LC50 (Leuciscus idus (Golden orfe)): > 10,000 mg/l Exposure time: 48 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): > 4.8 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: No toxicity at the limit of solubility.
Toxicity to algae	: EC50 (Pseudokirchneriella subcapitata (green algae)): > 0.9 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 Remarks: No toxicity at the limit of solubility.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC (Daphnia magna (Water flea)): > 0.22 mg/l Exposure time: 21 d Method: OECD Test Guideline 211 Remarks: No toxicity at the limit of solubility.

Toxicity to bacteria : EC10 (Pseudomonas putida): 883 mg/l
Exposure time: 16 h

Distillates (petroleum), hydrotreated middle:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 87,556 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
Exposure time: 48 h

Toxicity to algae : EC50 (Selenastrum capricornutum (green algae)): > 1,000 mg/l
Exposure time: 72 h

Toxicity to fish (Chronic toxicity) : NOELR: > 1,000 mg/l
Exposure time: 28 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOELR: 5 mg/l
Exposure time: 21 d

Toxicity to bacteria : EC50: > 100 mg/l
Exposure time: 3 h

Carbon black:

Toxicity to fish : LC0 (Danio rerio (zebra fish)): 1,000 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 5,600 mg/l
Exposure time: 24 h
Method: OECD Test Guideline 202

Toxicity to algae : NOEC (Desmodesmus subspicatus (green algae)): 10,000 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Octamethylcyclotetrasiloxane:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 0.022 mg/l
Exposure time: 96 h
Remarks: No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia sp.): > 0.015 mg/l
Exposure time: 48 h
Remarks: No toxicity at the limit of solubility.

Toxicity to algae : EC50: > 0.022 mg/l
Exposure time: 96 h
Remarks: No toxicity at the limit of solubility.

NOEC: 0.022 mg/l

Exposure time: 96 h
Remarks: No toxicity at the limit of solubility.

Toxicity to fish (Chronic toxicity) : NOEC (Oncorhynchus mykiss (rainbow trout)): >= 0.0044 mg/l
Remarks: No toxicity at the limit of solubility.

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): > 0.0079 mg/l
Exposure time: 21 d
Remarks: No toxicity at the limit of solubility.

Toxicity to bacteria : IC50: > 10,000 mg/l
Method: ISO 8192

Ecotoxicology Assessment
Chronic aquatic toxicity : May cause long lasting harmful effects to aquatic life.

Persistence and degradability

Ingredients:

Stearic acid:
Biodegradability : Result: Readily biodegradable.
Biodegradation: 93 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

Distillates (petroleum), hydrotreated middle:
Biodegradability : Result: Inherently biodegradable.

Octamethylcyclotetrasiloxane:
Biodegradability : Result: Not readily biodegradable.
Biodegradation: 3.7 %
Exposure time: 28 d
Method: OECD Test Guideline 310

Stability in water : Degradation half life: 69.3 - 144 h (24.6 °C) pH: 7
Method: OECD Test Guideline 111

Bioaccumulative potential

Ingredients:

Stearic acid:
Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 238 - 288
Remarks: Based on data from similar materials

Partition coefficient: n-octanol/water : log Pow: > 5

Octamethylcyclotetrasiloxane:
Partition coefficient: n-octanol/water : log Pow: 6.48 (25.1 °C)

Mobility in soil

No data available

Other adverse effects

Ingredients:

Octamethylcyclotetrasiloxane:

Results of PBT and vPvB assessment : Remarks: Octamethylcyclotetrasiloxane (D4) meets the current REACh Annex XIII criteria for PBT and vPvB. In Canada, D4 has been assessed and deemed to meet the PiT criteria. However, D4 does not behave similarly to known PBT/vPvB substances. The weight of scientific evidence from field studies shows that D4 is not biomagnifying in aquatic and terrestrial food webs. D4 in air will degrade by reaction with naturally occurring hydroxyl radicals in the atmosphere. Any D4 in air that does not degrade by reaction with hydroxyl radicals is not expected to deposit from the air to water, to land, or to living organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Resource Conservation and Recovery Act (RCRA) : This product has been evaluated for RCRA characteristics and does not meet the criteria of hazardous waste if discarded in its purchased form.

Waste from residues : Dispose of in accordance with local regulations.

Contaminated packaging : Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.

SECTION 14. TRANSPORT INFORMATION

International Regulation

UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation

49 CFR

Not regulated as a dangerous good

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity

Ingredients	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Methanol	67-56-1	5000	*
Ethylenediamine	107-15-3	5000	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

Ingredients	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Ethylenediamine	107-15-3	5000	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 311/312 Hazards : Chronic Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Cobalt aluminate blue spinel	1345-16-0	0.41 %

US State Regulations

Pennsylvania Right To Know

Calcium carbonate	471-34-1	30 - 50 %
Dimethyl siloxane, hydroxy-terminated	70131-67-8	30 - 50 %
Dimethyl siloxane, trimethylsiloxy-terminated	63148-62-9	5 - 10 %
Titanium dioxide	13463-67-7	1 - 5 %
Distillates (petroleum), hydrotreated middle	64742-46-7	1 - 5 %
Methanol	67-56-1	0 - 0.1 %

New Jersey Right To Know

Calcium carbonate	471-34-1	30 - 50 %
Dimethyl siloxane, hydroxy-terminated	70131-67-8	30 - 50 %
Dimethyl siloxane, trimethylsiloxy-terminated	63148-62-9	5 - 10 %
Titanium dioxide	13463-67-7	1 - 5 %
Stearic acid	57-11-4	1 - 5 %
Cobalt aluminate blue spinel	1345-16-0	0.1 - 1 %
Carbon black	1333-86-4	0.1 - 1 %

California Prop 65 WARNING: This product contains a chemical known in the

	State of California to cause birth defects or other reproductive harm.	
Methanol		67-56-1

The ingredients of this product are reported in the following inventories:

NZIoC	:	All ingredients listed or exempt.
REACH	:	All ingredients (pre-)registered or exempt.
TSCA	:	All chemical substances in this material are included on or exempted from listing on the TSCA Inventory of Chemical Substances.
PICCS	:	All ingredients listed or exempt.
KECI	:	All ingredients listed, exempt or notified.
ENCS/ISHL	:	All components are listed on ENCS/ISHL or exempted from inventory listing.
IECSC	:	All ingredients listed or exempt.
AICS	:	All ingredients listed or exempt.
DSL	:	All chemical substances in this product comply with the CEPA 1999 and NSNR and are on or exempt from listing on the Canadian Domestic Substances List (DSL).

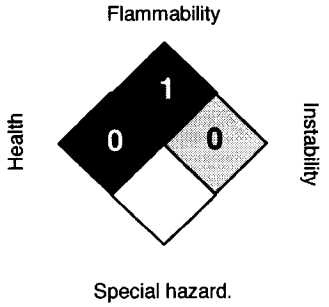
Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (USA)

SECTION 16. OTHER INFORMATION

Further information

NFPA:



HMIS III:

HEALTH	0*
FLAMMABILITY	1
PHYSICAL HAZARD	0

0 = not significant, 1 =Slight,
2 = Moderate, 3 = High
4 = Extreme, * = Chronic

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
DCC OEL	:	Dow Corning Guide
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	8-hour, time-weighted average
DCC OEL / TWA	:	Time weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / ST	:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA Z-1 / TWA	:	8-hour time weighted average
Sources of key data used to compile the Material Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agency, http://echa.europa.eu/
Revision Date	:	03/16/2015

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

US / Z8

SAFETY DATA SHEET
DOWCAL 10 & SOLUTIONS

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name	DOWCAL 10 & SOLUTIONS
Product number	10410
Synonyms; trade names	DOWCAL10 30% SOL,DOWCAL 10 41% SOL,DOWCAL 10 45% SOL,DOWCAL 10 55% SOL,DOWCAL 10 70% SOL,DOWCAL 10,DOWCAL 10 50%,DOWCAL 10 44%,DOWCAL 10 25%,DOWCAL 10 39%,DOWCAL 10 21%,DOWCAL 34%

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Coolant

1.3. Details of the supplier of the safety data sheet

Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 sds@univar.com +44 1274 267306

1.4. Emergency telephone number

Emergency Contact Number (Office Hours)	+44 1274 267346
Emergency Contact Number (Outside Office Hours)	+441865 407333
Sds No.	10410

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

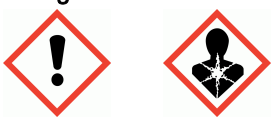
Classification

Physical hazards	Not Classified
Health hazards	Acute Tox. 4 - H302 STOT RE 2 - H373
Environmental hazards	Not Classified
Classification (67/548/EEC or 1999/45/EC)	Xn;R22.

2.2. Label elements

DOWCAL 10 & SOLUTIONS

Pictogram



Signal word Warning

Hazard statements
H302 Harmful if swallowed.
H373 May cause damage to organs through prolonged or repeated exposure if swallowed.

Precautionary statements
P260 Do not breathe vapour/spray.
P264 Wash contaminated skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P314 Get medical advice/attention if you feel unwell.
P330 Rinse mouth.
P501 Dispose of contents/container in accordance with national regulations.

Contains ETHANEDIOL

2.3. Other hazards

This product does not contain any substances classified as PBT or vPvB.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

ETHANEDIOL **60-100%**

CAS number: 107-21-1 EC number: 203-473-3 REACH registration number: 01-2119456816-28

Classification	Classification (67/548/EEC or 1999/45/EC)
Acute Tox. 4 - H302 STOT RE 2 - H373	Xn; R48/22, R22

SODIUM BENZOATE **1-5%**

CAS number: 532-32-1 EC number: 208-534-8 REACH registration number: 01-2119460683-35

Classification	Classification (67/548/EEC or 1999/45/EC)
Eye Irrit. 2 - H319	Xi;R36.

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation Move affected person to fresh air at once. Get medical attention if any discomfort continues.

Ingestion Get medical attention immediately. Rinse mouth thoroughly with water.

Skin contact Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.

Eye contact Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

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4.2. Most important symptoms and effects, both acute and delayed

Ingestion Causes damage to organs through prolonged or repeated exposure if swallowed. Harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor If several ounces (60 - 100 ml) of ethylene glycol have been ingested, early administration of ethanol may counter the toxic effects (metabolic acidosis, renal damage). Consider hemodialysis or peritoneal dialysis & thiamine 100 mg plus pyridoxine 50 mg intravenously every 6 hours. If ethanol is used, a therapeutically effective blood concentration in the range of 100 - 150 mg/dl may be achieved by a rapid loading dose followed by a continuous intravenous infusion. Consult standard literature for details of treatment. 4-Methyl pyrazole (Antizol®) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of ethylene glycol (EG), di- or triethylene glycol (DEG, TEG), ethylene glycol butyl ether (EGBE), or methanol intoxication if available. Fomepizole protocol: loading dose 15 mg/kg intravenously, follow by bolus dose of 10 mg/kg every 12 hours; after 48 hours, increase bolus dose to 15 mg/kg every 12 hours. Continue fomepizole until serum methanol, EG, DEG, TEG or EGBE are undetectable. The signs and symptoms of poisoning include anion gap metabolic acidosis, CNS depression, renal tubular injury, and possible late stage cranial nerve involvement. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. In severe poisoning, respiratory support with mechanical ventilation and positive end expiratory pressure may be required. Maintain adequate ventilation and oxygenation of the patient. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. If burn is present, treat as any thermal burn, after decontamination. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards Oxides of the following substances: Carbon.

5.3. Advice for firefighters

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

6.3. Methods and material for containment and cleaning up

DOWCAL 10 & SOLUTIONS

Methods for cleaning up Absorb spillage with inert, damp, non-combustible material. Flush contaminated area with plenty of water. Collect and place in suitable waste disposal containers and seal securely. For waste disposal, see Section 13.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid contact with skin and eyes.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a well-ventilated place.

7.3. Specific end use(s)

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

ETHANEDIOL

Long-term exposure limit (8-hour TWA): WEL 10 mg/m³ particulate
Sk
Long-term exposure limit (8-hour TWA): WEL 20 ppm 52 mg/m³ vapour
Short-term exposure limit (15-minute): WEL 40 ppm 104 mg/m³ vapour
Sk

WEL = Workplace Exposure Limit
Sk = Can be absorbed through the skin.

ETHANEDIOL (CAS: 107-21-1)

Ingredient comments WEL = Workplace Exposure Limits

DNEL
Industry - Inhalation; Short term : 35 mg/m³
Industry - Dermal; Long term : 106 mg/kg/day
Consumer - Dermal; Long term : 53 mg/kg/day
Consumer - Inhalation; Long term : 7 mg/m³

PNEC
- Fresh water; 10 mg/l
- Marine water; 1 mg/l
- Soil; 1.53 mg/l
- STP; 199.5 mg/l

SODIUM BENZOATE (CAS: 532-32-1)

Ingredient comments No exposure limits known for ingredient(s).

DOWCAL 10 & SOLUTIONS

DNEL	Industry - Dermal; Long term systemic effects: 34.7 mg/kg/day Consumer - Dermal; Long term systemic effects: 20.8 mg/kg/day Industry - Inhalation; Long term systemic effects: 10.4 mg/m³ Consumer - Inhalation; Long term systemic effects: 2.1 mg/m³ Consumer - Oral; Long term systemic effects: 25 mg/kg/day Industry - Inhalation; Long term local effects: 6.3 mg/m³ Consumer - Inhalation; Long term local effects: 1.3 mg/m³

8.2. Exposure controls

Protective equipment

Appropriate engineering controls	As this product contains ingredients with exposure limits, process enclosures, local exhaust ventilation or other engineering controls should be used to keep worker exposure below any statutory or recommended limits, if use generates dust, fumes, gas, vapour or mist.
Eye/face protection	The following protection should be worn: Chemical splash goggles or face shield. EN 166
Hand protection	For prolonged or repeated skin contact use suitable protective gloves. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. Rubber (natural, latex). Neoprene. Polyvinyl chloride (PVC). Nitrile rubber. Laminate of polyethylene and ethylene vinyl alcohol (PE/EVOH). EN 374
Other skin and body protection	Wear appropriate clothing to prevent any possibility of skin contact.
Hygiene measures	Wash after use and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product.
Respiratory protection	If ventilation is inadequate, suitable respiratory protection must be worn. Wear a respirator fitted with the following cartridge: Combination filter, type A2/P3. EN 136/140/145/143/149

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Various colours.
Odour	Odourless.
pH	pH (concentrated solution): 7.0 - 8.5
Melting point	Not applicable.
Initial boiling point and range	Not determined.
Flash point	120°C
Upper/lower flammability or explosive limits	Lower flammable/explosive limit: 3.2
Vapour pressure	3 mbar @ °C
Vapour density	>1.0
Relative density	1.044 - 1.134 @ 20°C
Solubility(ies)	Soluble in water.

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Auto-ignition temperature	435°C
Viscosity	Data lacking.
Explosive properties	Data lacking.
Oxidising properties	Not available.

9.2. Other information

Other information	No information required.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	Does not decompose when used and stored as recommended.

10.2. Chemical stability

Stability	Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	Will not polymerise.

10.4. Conditions to avoid

Conditions to avoid	Avoid excessive heat for prolonged periods of time.

10.5. Incompatible materials

Materials to avoid	Strong acids. Strong alkalis. Strong oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products	Oxides of the following substances: Carbon.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

ATE oral (mg/kg)	555.56

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	22,270.0
Species	Rabbit

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} dust/mist mg/l)	2.5

Inhalation	Extensive use of the product in areas with inadequate ventilation may result in the accumulation of hazardous vapour concentrations. Gas or vapour in high concentrations may irritate the respiratory system. Vapours may cause headache, fatigue, dizziness and nausea.
Ingestion	May cause irritation. Symptoms following overexposure may include the following: Stomach pain. Nausea, vomiting. Diarrhoea. May cause liver and/or renal damage. NB. Ethylene glycol: lethal dose, adult: 100 ml Harmful if swallowed. May cause damage to organs through prolonged or repeated exposure if swallowed.

DOWCAL 10 & SOLUTIONS

Skin contact Prolonged skin contact may cause temporary irritation.

Eye contact May cause temporary eye irritation.

Toxicological information on ingredients.

ETHANEDIOL

Acute toxicity - oral

ATE oral (mg/kg)	500.0

Acute toxicity - dermal

Acute toxicity dermal (LD_{50} mg/kg)	10,600.0
Species	Rabbit
Notes (dermal LD_{50})	LD_{50} > 10600 mg/kg, Dermal, Rabbit

Acute toxicity - inhalation

Acute toxicity inhalation (LC_{50} vapours mg/l)	2.5
Species	Rat
Notes (inhalation LC_{50})	LD_{50} > 2.5 mg/l, Inhalation, Rat
ATE inhalation (vapours mg/l)	2.5

Skin corrosion/irritation

Animal data	Data lacking.

Serious eye damage/irritation

Serious eye damage/irritation	Data lacking.

Skin sensitisation

Skin sensitisation	Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vivo	This substance has no evidence of mutagenic properties.

Carcinogenicity

Carcinogenicity	There is no evidence that the product can cause cancer.

Reproductive toxicity

Reproductive toxicity - development	Symptoms following overexposure may include the following: Possible risk of adverse reproductive effects.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure	May cause damage to organs (Kidneys) through prolonged or repeated exposure if swallowed.

Inhalation Vapour may irritate respiratory system/lungs.

DOWCAL 10 & SOLUTIONS

Ingestion	Harmful if swallowed. Lethal dose to humans 100ml
Skin contact	Prolonged and frequent contact may cause redness and irritation.
Eye contact	May cause temporary eye irritation.
Target organs	Liver Kidneys

SECTION 12: Ecological Information

Ecotoxicity The product components are not classified as environmentally hazardous. However, large or frequent spills may have hazardous effects on the environment.

12.1. Toxicity

Toxicity Not considered toxic to fish.

Ecological information on ingredients.

ETHANEDIOL

Acute toxicity - fish	LC50, 96 hours, 96 hours: 72860 mg/l, Pimephales promelas (Fat-head Minnow)
Acute toxicity - aquatic invertebrates	EC_{50}, 48 hours, 48 hours: > 100 mg/l, Daphnia magna
Acute toxicity - aquatic plants	EC_{50}, 96 hours, 96 hours: 6500 - 13000 mg/l,
Acute toxicity - microorganisms	EC_{50}, 30 min, 30 minutes: 225 mg/l, Activated sludge

12.2. Persistence and degradability

Persistence and degradability The product is readily biodegradable.

Ecological information on ingredients.

ETHANEDIOL

Persistence and degradability	The substance is readily biodegradable.
Biodegradation	- Degradation (%) 90%: > 10 days OECD 301A

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Ecological information on ingredients.

ETHANEDIOL

Bioaccumulative potential	The product is not bioaccumulating.
Partition coefficient	-1.36

12.4. Mobility in soil

Mobility The product is soluble in water.

Ecological information on ingredients.

DOWCAL 10 & SOLUTIONS

ETHANEDIOL

Mobility	The product is soluble in water.
Adsorption/desorption coefficient	Soil - Koc: 1 @ °C

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	This product does not contain any substances classified as PBT or vPvB.

Ecological information on ingredients.

ETHANEDIOL

Results of PBT and vPvB assessment	This substance is not classified as PBT or vPvB according to current EU criteria.

12.6. Other adverse effects

Other adverse effects	No information available.

Ecological information on ingredients.

ETHANEDIOL

Cod	1.22
Other adverse effects	None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information	Waste is classified as hazardous waste.
Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

SECTION 14: Transport information

General	The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID).

14.1. UN number

Not applicable.

14.2. UN proper shipping name

Not applicable.

14.3. Transport hazard class(es)

No transport warning sign required.

14.4. Packing group

Not applicable.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

DOWCAL 10 & SOLUTIONS

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716).

EU legislation Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

Guidance CHIP for everyone HSG228.
Workplace Exposure Limits EH40.
Safety Data Sheets for Substances and Preparations.
Approved Classification and Labelling Guide (Sixth edition) L131.

15.2. Chemical safety assessment

Not applicable.

SECTION 16: Other information

Revision comments NOTE: Lines within the margin indicate significant changes from the previous revision.

Revision date 28/05/2015

Revision 04

Supersedes date 08/10/2011

SDS number 10410

SDS status Approved.

Signature J Spenceley

Risk phrases in full NC Not classified.
R22 Harmful if swallowed.

Hazard statements in full H302 Harmful if swallowed.
H319 Causes serious eye irritation.
H373 May cause damage to organs (Kidneys) through prolonged or repeated exposure if swallowed.
H373 May cause damage to organs through prolonged or repeated exposure if swallowed.

TURKISH SIGNATURE

1. Product and company identification

Product identifier

Trade name: Release Fabrics/Peel Plies
Release Ply A, Release Ply Super A, Stitch Ply A, Release Ply B, Release Ply C, Release Ply F, Release Ply Super F, Release Ply G, Stitch Ply G, Ultra Ply 22 T, Bleeder Lease A, Bleeder Lease B, Bleeder Lease C, Bleeder Lease E, Bleeder Lease G, Superlease Blue, Econostitch , Econostitch G, Econoply E, Econoply J, Econolease, Dahltexx SP-2, 60B, 60BR, 80A, 80AR

Relevant identified uses of the substance or mixture and uses advised against

General use: Article: Release fabrics / Peel plies

Details of the supplier of the safety data sheet

Company name:

Airtech International, Inc.
5700 Skylab Road
Huntington Beach, CA 92647
E-mail: airtech airtechintl.com
Website: www.airtechonline.com
Telephone: +1 714.899.8100
Dept. responsible for information:
Telephone: +1 714.899.8100
E-mail: airtech airtechintl.com

Airtech Europe Sarl
Zone industrielle Haneboesch
L 4562 Differdange
Luxembourg
Website: www.airtech.lu
Telephone: +352 582.282
Dept. responsible for information:
Telephone: +352 582.282
E-mail: sales airtech.lu

Tygavac Advanced Materials Ltd.
The Causeway
Broadway Business Park
Chadderton, Oldham
OL9 9 D United Kingdom
Website: www.tygavac.co.uk
Telephone: +44 161.947.1610
Dept. responsible for information:
Telephone: +44 161.947.1610
E-mail: sales tygavac.co.uk

Airtech Asia Ltd. Ltd.
888 Airtech Avenue
Huangtai Industrial Development Center
iaozhan Country, Jinnan District
Tianjin, China 300353
E-mail: airtechasia airtechintl.com
Website: www.airtech.asia
Telephone: +86 22.8622.9800
Dept. responsible for information:
Telephone: +86 22.8622.9800
E-mail: airtechasia airtechintl.com

Emergency phone number

CHEMTREC EMERGENCY PHONE:
Within USA/Canada: 1-(800)424-9300
International: +1 703-741-5970

2. Hazards identification

Emergency overview

Appearance: Form: solid
Color: varying

Odor: odorless

Classification: Article not subject to hazard labelling or classification.

Regulatory status

This material is not considered hazardous by the U.S. OSHA Hazard Communication Standard (29 CFR 1910.1200) and SIMDUT in Canada.

Hazards not otherwise classified

Toxic fumes may be emitted at elevated temperatures. Do not breathe vapor. Processing, e.g. by cutting, sawing or grinding, can produce particles and dust. Avoid inhalation of dusts, as even inert dusts may functionally affect respiratory organs.
see section 11: Toxicological information

3. Composition / Information on ingredients

Chemical characterization: Article: Release fabrics / Peel plies

Material type : Nylon, polyester or fibreglass
Release Coating: Silicone or PTFE

4. First aid measures

In case of inhalation: In case of inhalation of decomposition products, affected person should be moved into fresh air and kept still. If the casualty has difficulty breathing, call a doctor immediately.

Following skin contact: Thoroughly wash skin with soap and water. In case of skin irritation, consult a physician.

After eye contact: In the event of irritation from processing vapors: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. In case of troubles or persistent symptoms, consult an opthalmologist.

After swallowing: Not a probable route of exposure.
In the case of the formation of dust: Rinse mouth. Seek medical treatment in case of troubles.

Most important symptoms/effects, acute and delayed

In case of inhalation:
Inhalation of dust may cause irritation of the respiratory system. Overheating released mist or vapors can irritate the respiratory tracts.
After contact with skin: itching redness of the skin and oedema (swelling).
The melted product can cause severe burns.
After eye contact:
Process vapors can irritate the eyes. Dust contact with the eyes can lead to mechanical irritation.

Information to physician

Treat symptomatically.

5. Fire fighting measures

Flash point/flash point range:
no data available

Auto-ignition temperature: no data available

Suitable extinguishing media:
Water fog, dry chemical powder, foam, carbon dioxide

Extinguishing media which must not be used for safety reasons:

High power water jet.

Specific hazards arising from the chemical

This material is combustible, but will not ignite readily. Toxic fumes may be emitted at elevated temperatures.
In case of strong heating / In case of fire may be liberated: Caprolactam, nitrogen oxides (NOx), carbon monoxide and carbon dioxide.

Protective equipment and precautions for firefighters:

Wear a self-contained breathing apparatus and chemical protective clothing.

Additional information: Seal off endangered area. Cool endangered containers with water spray and, if possible, remove from danger zone. Use a water fog to control vapors. Do not breathe fumes. Do not allow fire water to penetrate into surface or ground water.

6. Accidental release measures

Personal precautions: Handle in accordance with good industrial hygiene and safety practice.

At processing: Avoid the formation of aerosol/vapors. Avoid generation of dust. Avoid inhalation and contact with skin and eyes. Wear protective equipment. Keep unprotected people away. Ensure adequate ventilation, especially in confined areas.

Environmental precautions:

Do not allow to penetrate into soil, waterbodies or drains.

Methods for clean-up: Take up mechanically, placing in appropriate containers for disposal. Dispose of waste according to applicable legislation.

7. Handling and storage

Handling

Advices on safe handling: Handle in accordance with good industrial hygiene and safety practice.

At processing: Provide adequate ventilation, and local exhaust as needed. Avoid the formation of aerosol/vapors. Avoid generation of dust. Avoid inhalation and contact with skin and eyes. Wear protective equipment. Keep unprotected people away. When using do not eat, drink or smoke.

Precautions against fire and explosion:

Take standard precautions to prevent fire.

Storage

Requirements for storerooms and containers:

Keep in a cool place. Keep container dry. Protect from direct sunlight. Do not freeze. Store at room temperature.

Hints on joint storage: Incompatible materials: Strong bases, strong acids, strong oxidizing agents.
Keep away from food and drinks.

8. Exposure controls / personal protection

Exposure guidelines

Occupational exposure limit values:

Type	Limit value
USA: ACGIH: TWA	10 mg/m Dust limit value, indicativ; inhalable fraction
USA: ACGIH: TWA	3 mg/m Dust limit value, indicativ; respirable fraction
USA: OSHA: TWA	15 mg/m Dust limit value inhalable fraction
USA: OSHA: TWA	5 mg/m Dust limit value respirable fraction

Engineering controls

Provide good ventilation and/or an exhaust system in the work area.
In case of development of vapors or dust (at processing): Use local exhaust.
See also information in chapter 7, section storage.

Personal protection equipment (PPE)

Eye/face protection: At processing (recommended): Safety glasses in accordance with OSHA 29 CFR: 1910.133 or ANSI Z87.1-2010.

Skin protection: At processing (recommended): Wear suitable protective clothing.

Recommendation:
Protective gloves according to OSHA Standard - 29 CFR: 1910.138.
Glove material: nitrile rubber (0.11 mm)
Breakthrough time: 480 min.
Observe glove manufacturer s instructions concerning penetrability and breakthrough time.

Respiratory protection: Respiratory protection is not necessary if room is well ventilated.

At processing:
When vapors form, use respiratory protection. The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If the concentration is exceeded, self-contained breathing apparatus must be used.

General hygiene considerations:

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and after work. When using do not eat, drink or smoke.

At processing:
Avoid contact with skin, eyes, and clothing. Do not breathe vapors. Do not breathe dust.

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance: Form: solid
Color: varying

Odor: odorless

Odor threshold: no data available

pH value: no data available

Melting point/freezing point:	no data available
Initial boiling point and boiling range:	no data available
Flash point/flash point range:	no data available
Evaporation rate:	no data available
Flammability:	This material is combustible, but will not ignite readily.
Explosion limits:	no data available
Vapor pressure:	no data available
Vapor density:	no data available
Density:	no data available
Water solubility:	insoluble
Partition coefficient: n-octanol/water:	no data available
Auto-ignition temperature:	no data available
Thermal decomposition:	no data available
Additional information:	no data available

10. Stability and reactivity

Reactivity: Refer to section: Possibility of hazardous reactions.

Chemical stability: Stable under recommended storage conditions.

Possibility of hazardous reactions
No dangerous reactions with proper and specified storage and handling

Conditions to avoid: Keep away from heat. Protect from direct sunlight. Avoid generation of dust. Avoid the formation of aerosol/vapors.

Incompatible materials: Strong bases, strong acids, strong oxidizing agents.

Hazardous decomposition products:
In case of strong heating / In case of fire may be liberated: Caprolactam, nitrogen oxides (NOx), carbon monoxide and carbon dioxide.

Thermal decomposition: no data available

11. Toxicological information

Toxicological tests

Toxicological effects: Acute toxicity (oral): Lack of data.

Acute toxicity (dermal): Lack of data.

Acute toxicity (inhalative): Lack of data.

Skin corrosion/irritation: Lack of data.

Eye damage/irritation: Lack of data.

Sensitisation to the respiratory tract: Lack of data.

Skin sensitisation: Lack of data.

Germ cell mutagenicity/Genotoxicity: Lack of data.

Carcinogenicity: Lack of data.

Reproductive toxicity: Lack of data.

Effects on or via lactation: Lack of data.

Specific target organ toxicity (single exposure): Lack of data.

Specific target organ toxicity (repeated exposure): Lack of data.

Aspiration hazard: Lack of data.

Other information: Toxic fumes may be emitted at elevated temperatures. Processing, e.g. by cutting, sawing or grinding, can produce particles and dust. Dust may irritate airways and cause bronchitis symptoms.

Symptoms

In case of inhalation:
Inhalation of dust may cause irritation of the respiratory system. Overheating released mist or vapors can irritate the respiratory tracts.
After contact with skin: itching redness of the skin and oedema (swelling).
The melted product can cause severe burns.
After eye contact:
Process vapors can irritate the eyes. Dust contact with the eyes can lead to mechanical irritation.

12. Ecological information

Ecotoxicity

Effects in sewage plants: The insoluble part can be precipitated mechanically in suitable sewage treatment plants.

Mobility in soil

no data available

Persistence and degradability

Further details: Product is not biodegradable.

Additional ecological information

General information: Do not allow to penetrate into soil, waterbodies or drains.

13. Disposal considerations

Product

Recommendation: Dispose of waste according to applicable legislation.

Contaminated packaging

Recommendation: Dispose of waste according to applicable legislation. Handle contaminated packages in the same way as the substance itself. Non-contaminated packages may be recycled. Do not remove label until container is thoroughly cleaned.

14. Transport information

USA: Department of Transportation (DOT)

Proper shipping name: Not restricted

Sea transport (IMDG)

Proper shipping name: Not restricted
Marine pollutant: no

Air transport (IATA)

Proper shipping name: Not restricted

Further information

No dangerous good in sense of these transport regulations.

15. Regulatory information

National regulations - Great Britain

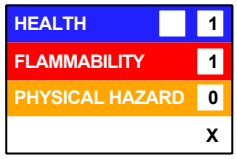
Hazchem-Code: -

16. Other information

Hazard rating systems:

NFPA Hazard Rating:
Health: 1 (Slight)
Fire: 1 (Slight)
Reactivity: 0 (Minimal)

HMIS Version III Rating:
Health: 1 (Slight)
Flammability: 1 (Slight)
Physical Hazard: 0 (Minimal)
Personal Protection: = Consult your supervisor



Reason of change: General revision

Department issuing data sheet

Contact person: see section 1: Dept. responsible for information

This data sheet cannot cover all possible situations which the user may experience during processing. Each aspect of your operation should be examined to determine if, and which additional precautions may be necessary. All health and safety information contained in this data sheet should be provided to your employees and customers. It is your responsibility to develop appropriate workplace instructions and training programs for employees.

As the conditions and methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this product. The information supplied on this safety data sheet complies with our current level of knowledge as well as with national and EU regulations. All statements or suggestions are made without warranty, expressed or implied, regarding accuracy of information, the hazards connected with the use of the product or the results to be obtained from the use thereof.

Safety Data Sheet

Efaspray 0790

Replaces date: 02/02/2015 Revision date: 17/04/2015

SECTION 1: Identification of the substance/preparation and of the company/undertaking

1.1. Product identifier

Trade name: Efaspray 0790

Article no

Article no	Description
0790	

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended uses: Coating of metal.

Inadvisable uses: The product is recommended for only the above described uses.

1.3. Details of the supplier of the safety data sheet

Supplier

Company: Esbjerg Farve- & Lakfabrik A/S

Address: Energivej 13

Zip code: DK-6700 Esbjerg

Country: DENMARK

E-mail: info@esbjergpaints.dk

Phone: 0045 75 12 86 00

Fax: 0045 75 45 33 68

1.4. Emergency Telephone Number

GB: +44 1215074123 (Advice and guidance) (Around the clock)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

CLP-classification: Aerosol 1;H222 Aerosol 2;H229 Acute Tox. 4;H312/332 Skin Irrit. 2;H315 Eye Irrit. 2;H319 STOT SE 3;H336 Aquatic Chronic 3;H412

2.2. Label elements

Pictograms

Signal word: Danger

Contains

Substance: acetone, Xylene

Hazard Statements

H222	Extremely flammable aerosol.
H229	Pressurised container: May burst if heated.
H312/332	Harmful in contact with skin or if inhaled.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statements

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P211	Do not spray on an open flame or other ignition source.
P251	Do not pierce or burn, even after use.
P261	Avoid breathing vapours/spray.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/eye protection/face protection.
P410/412	Protect from sunlight. Do no expose to temperatures exceeding 50 °C/122°F.
P501	Dispose of contents/container to local regulations.

Supplemental information

EUH066	Repeated exposure may cause skin dryness or cracking.

Only self-contained breathing apparatus must be used as the product contains volatile liquids the vapors of which are not detained by carbon filters.

2.3. Other hazards

No known information.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Substance	CAS number	EC No	REACH Reg. No.	Concentration	Notes	CLP-classification
acetone	67-64-1	200-662-2	01-2119471330-49	25 - 50%		F;R11 Xi;R36 ;R66 ;R67
propane	74-98-6	200-827-9		25 - 50%		Fx;R12
Xylene	1330-20-7	215-535-7	01-2119488216-32	10 - 25%		;R10 Xn;R20/21 Xi;R38
Butane (containing < 0,1 % butadiene (203-450-8))	106-97-8	203-448-7		2.5 - 10%		Fx;R12
n-butyl acetate	123-86-4	204-658-1		2.5 - 10%		;R10 ;R66 ;R67
Kerosine - unspecified, Solvent naphtha (petroleum), heavy arom.	64742-94-5	265-198-5	01-2119463583-34	2.50 - 10%		Xn,N,R51/53 - R65 - R66 - R67
ethylbenzene	100-41-4	202-849-4		< 2.5%		Xn,F,R11 - R20

Please see section 16 for the full text of R-phrases and H-phrases.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation: If patient feels unwell move to fresh air and keep under surveillance. If the victim is unconscious, ascertain whether the victim is breathing. If breathing has stopped, apply artificial respiration. If the victim is unconscious but breathing, place in the recovery position and keep warm with blankets. Call for medical attention or ambulance.

Ingestion: Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn´t enter the lungs. Get medical attention immediately!

Skin contact: Promptly wash contaminated skin with soap or mild detergent and water. Promptly remove clothing if soaked through and wash as above. Do not use solvents.

Eye contact: Flush immediately with water (preferably using eye wash equipment) for at least 5 minutes. Open eye wide. Remove any contact lenses. Seek medical advice.

General: If in doubt, seek medical advice. Also see para. 1

4.2. Most important symptoms and effects, both acute and delayed

Pain in the eyes, redness, tears, swollen eyelids, itching Headache, dizziness, drowsiness and nausea.

4.3. Indication of any immediate medical attention and special treatment needed

Seek medical advice in case of discomfort. Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media: Fire can be extinguished with carbon dioxide, powder, foam or water spray.

Unsuitable extinguishing media: Do not use a direct water jet that could spread the fire.

5.2. Special hazards arising from the substance or mixture

Avoid inhaling of waste gases. Combustion will generate harmful gases, as combustion residues and carbon monoxide.

5.3. Advice for fire-fighters

Cool closed containers with water. Fire will produce a thick black smoke. Products of combustion are harmful and respiratory protection is required.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: Avoid inhalation of vapours. Remove all ignition sources and ensure sufficient ventilation.

For emergency responders: Use nitrile protection gloves and self-contained breathing apparatus.

6.2. Environmental precautions

Notify proper authorities in case of contamination of soil or aquatic environment or discharge to drains.

6.3. Methods and material for containment and cleaning up

Prevent major quantities of spillage from being discharged into the sewage system or water by banking the spillage with sand or the like and collecting it. Clean the contaminated area with a suitable cleaning agent, but do not use solvent.

6.4. Reference to other sections

Also see item 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

The product may be charged electrostatically. Always use underground wire when transferring from one container to another. Personnel should wear antistatic shoes and clothing. Floors should be conductive. Do not use tools which may produce sparks. Avoid contact with eyes and skin. Avoid inhaling vapors and spray mists. Vapors may form explosive mixtures with air. Prevent the formation of flammable or explosive mixtures. Do not use this material near naked flames or any other ignition source. Electrical installations must be protected according to regulations.

7.2. Conditions for safe storage, including any incompatibilities

The product must be kept away from children. Store in a tightly closed container and in accordance with the current regulations in a dry and well-ventilated place away from food. Keep away from ignition sources, oxidizing agents and strong acidic and basic substances. No smoking and use of open fire. No admittance to unauthorized persons. Opened containers must be carefully closed and stored upright to prevent any leakage.

7.3. Specific end use(s)

Applications is mentioned in item 1.2.

Other Information: Smoking and the consumption of food and drink are not permitted in work rooms. Personal protective equipment: Refer to section 8.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limit

Substance name	Time period	ppm	mg/m3	Comment	Remarks
acetone	8h	500	1210		
acetone	15m	1500	3620		
Xylene	8h	50	220		BMGV, Sk
Xylene	15m	100	441		BMGV, Sk
n-butyl acetate	8h	150	724		
n-butyl acetate	15m	200	966		
Butane (containing < 0,1 % butadiene (203-450-8))	8h	600	1.450		
Butane (containing < 0,1 % butadiene (203-450-8))	15m	750	1.810		

BMGV = Biological monitoring may be appropriate and Biological Monitoring Guidance Value is listed in Table 3 (Occupational Exposure Limits)

Sk = Can be absorbed throuh skin

Legal basis: EH40/2005 Workplace exposure limits incl. supplement from October 2007.

PNEC

acetone				
Exposure	Value	Assessment Factor	Extrapolation Method	Note
Freshwater	10,6 mg/l			
Soil	33,3 mg/l			
Marine water	1,06 mg/l			

Xylene				
Exposure	Value	Assessment Factor	Extrapolation Method	Note
Freshwater	0,327 mg/l			
Marine water	0,327 mg/l			
Freshwater - sediment	12,46 mg/kg			
Marine water - sediment	12,46 mg/kg			
Soil	2,31 mg/kg			

n-butyl acetate				
Exposure	Value	Assessment Factor	Extrapolation Method	Note
Freshwater - sediment	0,981 mg/kg			
Marine water - sediment	0,0981 mg/kg			
Soil	0,0903 mg/kg			
Marine water	0,018 mg/l			
Freshwater	0,18 mg/l			

ethylbenzene				
Exposure	Value	Assessment Factor	Extrapolation Method	Note
	0,1 mg/l			
	0,01 mg/l			
	13,7 mg/kg			
	2,68 mg/kg			

DNEL - workers

acetone					
Exposure	Value	Assessment Factor	Dose Descriptor	Main Impact Parameter	Note
Inhalation	1210 mg/m3	Long-term exposure			
Inhalation	2420 mg/m3	Acute / short-term exposure			
Dermal	186 mg/kg	Long-term exposure			

Xylene					
Exposure	Value	Assessment Factor	Dose Descriptor	Main Impact Parameter	Note
Inhalation	289 mg/m3	Acute / short-term exposure		Systemic effects	
Inhalation	289 mg/m3	Acute / short-term exposure		Local effects	
Dermal	180 mg/kg bw/day	Long-term exposure		Systemic effects	
Inhalation	77 mg/m3	Long-term exposure		Systemic effects	

Kerosine - unspecified, Solvent naphtha (petroleum), heavy arom.					
Exposure	Value	Assessment Factor	Dose Descriptor	Main Impact Parameter	Note
Inhalation	150 mg/m3	Long-term exposure		Systemic effects	
Dermal	12,5 mg/kg bw/day	Long-term exposure		Systemic effects	

n-butyl acetate					
Exposure	Value	Assessment Factor	Dose Descriptor	Main Impact Parameter	Note
Inhalation	960 mg/m3	Acute / short-term exposure		Local effects	
Inhalation	480 mg/m3	Long-term exposure		Systemic effects	
Inhalation	960 mg/m3	Acute / short-term exposure		Systemic effects	

ethylbenzene					
Exposure	Value	Assessment Factor	Dose Descriptor	Main Impact Parameter	Note
Inhalation	293 mg/m3	Acute / short-term exposure		Local effects	
Dermal	180 mg/kg bw/day	Long-term exposure		Systemic effects	
Inhalation	77 mg/m3	Long-term exposure		Systemic effects	

DNEL - general population

Kerosine - unspecified, Solvent naphtha (petroleum), heavy arom.					
Exposure	Value	Assessment Factor	Dose Descriptor	Main Impact Parameter	Note
Dermal	7,5 mg/kg bw/day	Long-term exposure		Systemic effects	
Inhalation	32 mg/m3	Long-term exposure		Systemic effects	
Oral	7,5 mg/kg bw/day	Long-term exposure		Systemic effects	

Biological threshold values: See above.

Other Information: See above.

8.2. Exposure controls

Appropriate engineering controls: All work must be planned with a view to limit the breathing of fumes and the exposure to the skin. Work under effective process ventilation (e.g. local exhaust ventilation). If this is not possible, use respiratory protection.

Personal protective equipment, eye/face protection: Use suitable protective goggles or full face mask for protection against splashes.

Personal protective equipment, hand protection: Use 4H protection gloves. Break-through time is 8 hours. Cotton gloves may be used under, and a disposable glove over the 4H glove. Follow the glove manufacturer's recommendations on use and replacement.

Personal protective equipment, skin protection: If possible, wear special work clothes. When spraying wear coveralls.

Personal protective equipment, respiratory protection: Use compressed-air full face mask.

Environmental exposure controls: It must be ensured that local regulations for discharge are met.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Parameter	Value/unit
State	Liquid
Colour	Different
Odour	Odour of organic solvent.
Solubility	Soluble in: Organic solvents.
Explosive properties	

Oxidising properties	

Parameter	Value/unit	Remarks
pH (solution for use)	No data	
pH (concentrate)	No data	
Melting point	No data	
Freezing point	No data	
Initial boiling point and boiling range	No data	
Flash Point	< 21 °C	
Evaporation rate	No data	
Flammability (solid, gas)	No data	
Flammability limits	No data	
Explosion limits	1.80 - 8.40	
Vapour pressure	No data	
Vapour density	No data	
Relative density	No data	
Partition coefficient n-octonol/water	No data	
Auto-ignition temperature	No data	
Decomposition temperature	No data	
Viscosity	No data	
Odour threshold	No data	

9.2 Other information

Parameter	Value/unit	Remarks
Density	1 g/ml	
Fire class:	I-1	
Weight % organic solvents:	75	
VOC	750	

Other Information: Solubility in water: Insoluble in water. Fat solubility: irrelevant

SECTION 10: Stability and reactivity

10.1. Reactivity

See below.

10.2. Chemical stability

Stable under recommended storage and handling conditions.

10.3. Possibility of hazardous reactions

Ignitable at temperatures above the flash point. The fumes can ignite by e.g. a spark, a warm surface or a glow. The fumes can mix to explosive mixtures with air. At room temperature the fumes are more heavily than air and can spread along the floor.

10.4. Conditions to avoid

Stable at normal temperature. When exposed to high temperatures, toxic decomposition products may be formed.

10.5. Incompatible materials

To prevent heat-generating reactions, keep the product away from oxidizing agents and strong acidic and basic substances.

10.6. Hazardous decomposition products

carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

acetone

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rat	LD50		5800 mg/kg		OECD 401	

Xylene

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rat	LD50		> 4300mg/kg			

Kerosine - unspecified, Solvent naphtha (petroleum), heavy arom.

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rat	LD50		> 5000mg/kg		OECD 401	

n-butyl acetate

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rat	LD50		4700mg/kg			

Ingestion of large quantities may cause gastrointestinal disorders.

Acute toxicity - dermal

acetone

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rat	LD50		> 15800mg/kg			

Xylene

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rabbit	LD50		3200 mg/kg			

Kerosine - unspecified, Solvent naphtha (petroleum), heavy arom.

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rabbit	LD50		> 2000mg/kg		OECD 402	

Organic solvents may be absorbed through skin. Organic solvents have a degreasing effect on the skin.

Acute toxicity - inhalation

acetone

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
	LC50	4 h	76 mg/l			

Xylene

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rat	LC50	4 h	21.7 mg/l			

Kerosine - unspecified, Solvent naphtha (petroleum), heavy arom.

Organism	Test Type	Exposure time	Value	Conclusion	Test method	Source
Rat	LC50		4688ppm		OECD 403	

Protracted inhalation in high concentrations may cause permanent damage to the central nervous system. Inhalation of vapors may cause symptoms of poisoning such as memory and concentration difficulties, abnormal tiredness, irritability and, in extreme cases, unconsciousness.

Skin corrosion/irritation: Prolonged or repeated skin contact will degrease skin and may cause irritation.

Serious eye damage/eye irritation: Splashing into eyes may cause smarting/irritation.

Germ cell mutagenicity: Would not be expected germ cell mutagen

Carcinogenic properties: No data.

Reproductive toxicity: Would not be expected to be a reproductive toxicant.

Single STOT exposure: No data.

Repeated STOT exposure: No data

SECTION 12: Ecological information

12.1. Toxicity

acetone

Organism	Species	Exposure time	Test Type	Value	Conclusion	Test method	Source
Acute daphnia	Daphnia magna	48 h	EC50	8800 mg/l			
Acute fish	Onchorhynchus mykiss	96 h	LC50	5540 mg/l			

Xylene

Organism	Species	Exposure time	Test Type	Value	Conclusion	Test method	Source
Acute Daphnia		24 h	EC50	165 mg/l			
Acute fish		96 h	LC50	1 - 10mg/l			

Kerosine - unspecified, Solvent naphtha (petroleum), heavy arom.

Organism	Species	Exposure time	Test Type	Value	Conclusion	Test method	Source
Acute Daphnia	Daphnia magna	48 h	EL50	3 - 10mg/l			
Acute algae	Pseudokirchneriella subcapitata	72 h	NOELR	2.5mg/l			
Acute algae	Pseudokirchneriella subcapitata	72 h	EL50	11mg/l			
Acute fish	Onchorhynchus mykiss	96 h	LL50	2 - 5mg/l			

n-butyl acetate

Organism	Species	Exposure time	Test Type	Value	Conclusion	Test method	Source
Acute algae		72 h	EC50	6477mg/l			
Acute daphnia	Daphnia magna	48 h	EC50	44mg/l			

ethylbenzene

Organism	Species	Exposure time	Test Type	Value	Conclusion	Test method	Source
Acute fish	Cyprinodon variegatus	96 h	LC50	88mg/l			
Acute Daphnia	#Not translated#	48 h	EC50	290mg/l			

12.2. Persistence and degradability

Kerosine - unspecified, Solvent naphtha (petroleum), heavy arom.

Organism	Species	Exposure time	Test Type	Value	Conclusion	Test method	Source
		28 d		49.56%			

n-butyl acetate

Organism	Species	Exposure time	Test Type	Value	Conclusion	Test method	Source
		28 d	BOD	98%		BOD:ThOD	

No information available

12.3. Bioaccumulative potential

No information available

12.4. Mobility in soil

The product is insoluble in water and will spread out on the surface.

12.5. Results of PBT and vPvB assessment

No information available

12.6. Other adverse effects

No information available

Other Information

Do not dispose of this product in drains, watercourses, or on the ground. This product is classified as hazardous to the environment according to the calculation method. Please see par. 2 and 3 for further information.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product residues are classified as chemical waste.

Waste-code: 16 05 04

SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN-No.: 1950

14.2. UN proper shipping name: AEROSOLES

14.3. Transport hazard class(es): 2.1

Hazard label(s):

Hazard identification number:

14.4. Packing group:

14.5. Environmental hazards:

Tunnel restriction code:

Other Information:

Inland water ways transport (ADN)

14.1. UN-No.:	1950	**14.4. Packing group:**	
14.2. UN proper shipping name:	AEROSOLES	**14.5. Environmental hazards:**	
14.3. Transport hazard class(es):	2.1		
Hazard label(s):			
Environmentally hazardous in tank vessels:		**Other Information:**	

Sea transport (IMDG)

14.1. UN-No.:	1950	**14.4. Packing group:**	
14.2. UN proper shipping name:	AEROSOLES	**14.5. Environmental hazards:**	
14.3. Transport hazard class(es):	2.1	**Environmental Hazardous Substance Name(s):**	
Hazard label(s):			
EmS:	F-D, S-U	**IMDG Code segregation group:**	

Other Information:

Air transport (ICAO-TI / IATA-DGR)

14.1. UN-No.:	1263	**14.4. Packing group:**	
14.2. UN proper shipping name:	AEROSOLES	**14.5. Environmental hazards:**	
14.3. Transport hazard class(es):	2.1		
Hazard label(s):		**Other Information:**	

14.6. Special precautions for user

Irrelevant.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC code

Irrelevant.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Special Provisions:

15.2. Chemical Safety Assessment

Other Information: Chemical safety assessment has not been performed.

SECTION 16: Other information

Version history and indication of changes

Version	Revision date	Responsible	Changes
10.0.0	15/08/2012	GK	REACH data sheet
11.0.0	16/04/2013	GK	2
12.0.0	08/11/2013	GK	8, 13, 15, 16
13.0.0	02/02/2015	GK	2, 3, 8, 11, 12

Abbreviations: DNEL: Derived No Effect Level. PNEC: Predicted No Effect Concentration.

References to literature and data sources: REACH: REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals. DPD: Directive of the European Parliament and of the Council concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations. CLP: REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on classification, labelling and packaging of substances and mixtures.

Other Information: The information in this Material Safety Data Sheet is based upon our knowledge and on European Union legislation. The user's working conditions are outside our control. It is the responsibility of the users to fulfil the requirements set by National Legislation. The information is no guarantee of the properties of the product. The Material Safety Data Sheet may only be reproduced with the permission of the manufacturer.

Training advice: The instructions in this Material Safety Data Sheet are given on the assumption that the product is used as stated in item 1. Restrictions of use and special training requirements must also be complied with. The information in this Material Safety Data Sheet should be regarded as a description of the safety issues concerning the product.

List of relevant H-statements

H220	Extremely flammable gas.
H222	Extremely flammable aerosol.
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H229	Pressurised container: May burst if heated.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H312/332	Harmful in contact with skin or if inhaled.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H336	May cause drowsiness or dizziness.
H373	May cause damage to organs through prolonged or repeated exposure.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Document language: GB

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 03/02/2016 *Version number 4* *Revision: 01/19/2016*

*
1 Identification of the substance/mixture and of the company/undertaking

· **Product identifier**

· **Trade name: Epilox® A 18-00**

· **Article number:** 0104
· **CAS Number:**
25068-38-6
· **NLP Number:**
500-033-5
· **Index number:**
603-074-00-8
· **Registration number** 01-2119456619-26-0006
· **Application of the substance / the mixture** Epoxy binder

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
LEUNA-Harze GmbH
Am Haupttor, Bau 6619
D-06237 Leuna
Telefon 03461 43 3639
e-Mail: infomsds.harze@leuna.de

· **Further information obtainable from:**
Abteilung Qualitätssicherung
Dr. Karin Bierögel
Telefon 03461 43 4654
Telefax 03461 43 4574
Telefon außerhalb der Geschäftszeit: 03461 43 6188
· **Emergency telephone number:**
Leitstelle Werkfeuerwehr
03461 434333

2 Hazards identification

· **Classification of the substance or mixture**

GHS07

Skin Irritation - Category 2 H315 Causes skin irritation.
Eye Irritation - Category 2 H319 Causes serious eye irritation.
Skin Sensitizer - Category 1 H317 May cause an allergic skin reaction.

· **Label elements**
· **GHS label elements**
The substance is classified and labelled according to the Globally Harmonised System (GHS).
· **Hazard pictograms**

GHS07

· **Signal word** Warning

· **Hazard-determining components of labelling:**
reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)

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· **Hazard statements**
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
· **Precautionary statements**

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P321	Specific treatment (see on this label).
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterisation: Substances**
· **CAS No. Description**
25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin
(number average molecular weight = 700)
· **Identification number(s)**
· **NLP Number:** 500-033-5
· **Index number:** 603-074-00-8

4 First aid measures

· **Description of first aid measures**
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:**
If skin irritation continues, consult a doctor.
Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
If symptoms persist consult doctor.
Rinse out mouth and then drink plenty of water.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Firefighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, powder or water spray. Fight larger fires with water spray.
Use fire extinguishing methods suitable to surrounding conditions.
· **Special hazards arising from the substance or mixture**
Carbon monoxide (CO)
Under certain fire conditions, traces of other toxic gases cannot be excluded, e.g.:

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· ***Advice for firefighters***
· ***Protective equipment:***
Wear self-contained respiratory protective device.
Wear fully protective suit.
· ***Additional information***
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.
Collect contaminated fire fighting water separately. It must not enter the sewage system.

6 Accidental release measures

· ***Personal precautions, protective equipment and emergency procedures***
Wear protective equipment. Keep unprotected persons away.
· ***Environmental precautions:***
Do not allow to penetrate the ground/soil.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· ***Methods and material for containment and cleaning up:***
Dispose contaminated material as waste according to item 13.
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
· ***Reference to other sections***
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· ***Handling:***
· ***Precautions for safe handling*** *Ensure good ventilation/exhaustion at the workplace.*
· ***Information about fire - and explosion protection:*** *No special measures required.*

· ***Conditions for safe storage, including any incompatibilities***
· ***Storage:***
· ***Requirements to be met by storerooms and receptacles:*** *Prevent any seepage into the ground.*
· ***Information about storage in one common storage facility:*** *Not required.*
· ***Further information about storage conditions:***
Store in cool, dry conditions in well sealed receptacles.
Store receptacle in a well ventilated area.
· ***Specific end use(s)*** *No further relevant information available.*

8 Exposure controls/personal protection

· ***Additional information about design of technical facilities:*** *No further data; see item 7.*

· ***Control parameters***
· ***Ingredients with limit values that require monitoring at the workplace:*** *Not required.*
· ***DNELs***
Dermal: 8.33 mg/kg bw/day
Inhalation: 12.25 mg/m³
· ***PNECs***
STP: 10 mg/l
Freshwater: 0.006 mg/l
Freshwater sediment: 0.0627 mg/kg wwt
Marine water: 0.0006 mg/l
Marine water sediment: 0.00627 mg/kg wwt
Soil: 0.0478 mg/kg wwt
· ***Additional information:*** *The lists valid during the making were used as basis.*

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· ***Exposure controls***
· ***Personal protective equipment:***
· ***General protective and hygienic measures:***
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· ***Respiratory protection:***
Filter A/P2
Use suitable respiratory protective device only when aerosol or mist is formed.
· ***Protection of hands:***

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· ***Material of gloves***
Recommended thickness of the material: ≥ 0.4 mm
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Butyl rubber, BR
Nitrile rubber, NBR
· ***Penetration time of glove material***
The determined penetration times according to EN 374 part III are not performed under practical conditions.
Therefore a maximum wearing time, which corresponds to 50% of the penetration time, is recommended.
· ***Eye protection:***

Tightly sealed goggles

· ***Body protection:*** *Protective work clothing*

9 Physical and chemical properties

· ***Information on basic physical and chemical properties***	
· ***General Information***	
· ***Appearance:***	
Form:	*Viscous*
Colour:	*Light yellow*
· ***Odour:***	*Nearly odourless*
· ***Change in condition***	
Melting point/Melting range:	*30 - 50 °C*
Boiling point/Boiling range:	*> 320 °C (DSC)*
Solidification point:	*- 16 °C (TG)*
· ***Flash point:***	*266 °C (EU A.9)*
· ***Ignition temperature:***	*455 °C*
· ***Danger of explosion:***	*Product does not present an explosion hazard.*
· ***Vapour pressure at 25 °C:***	*0.0000046 hPa*
· ***Density at 20 °C:***	*1.17 g/cm³*

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· **Solubility in / Miscibility with water at 20 °C:**	0.0069 g/l
· **organic solvents:**	Miscible with many organic solvents.
· **Partition coefficient (n-octanol/water) at 25 °C:**	3.242 log POW (modified shake flask test)
· **Viscosity:**	
Dynamic at 25 °C:	8 - 10 Pa.s
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions**
Exothermic polymerisation.
Reacts with amines.
Reacts with acids.
Reacts with alkali (lyes).
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** Irritant gases/vapours

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity**

· **LD/LC50 values relevant for classification:**

25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)

Oral	LD50	15 000 mg/kg bw (Rat)
Dermal	LD50	23 000 mg/kg bw (rabbit)

· **Primary irritant effect:**
· **Skin corrosion/irritation** Irritant to skin and mucous membranes.
· **Serious eye damage/irritation** Irritating effect.
· **Respiratory or skin sensitisation** Sensitisation possible through skin contact.
· **Repeated dose toxicity**
NOAEL (oral): 50 mg/kg bw/day
NOEAL (dermal): 100 mg/kg bw/day

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:**

25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)

EC50/48h	1.8 mg/l (daphnia)
EC50/72h	11 mg/l (Alg)
LC50/96h	2.0 mg/l (leuciscus idus)

· **Persistence and degradability** No further relevant information available.
· **Other information:** The product is not easily biodegradable.

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Trade name: Epilox® A 18-00

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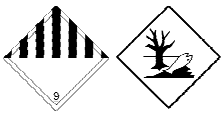
· **Behaviour in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Ecotoxical effects:**
· **Remark:** Toxic for fish
· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (German Regulation) (Assessment by list): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Toxic for aquatic organisms
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation** Must be specially treated adhering to official regulations.

· **Uncleaned packaging:**
· **Recommendation:**
Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

*
14 Transport information

· **UN-Number**	
· **TDG, IMDG, IATA**	UN3082
· **UN proper shipping name**	
· **TDG**	3082 UMWELTGEFÄHRDENDER STOFF, FLÜSSIG, N.A.G. (Reaktionsprodukt: Bisphenol-A-Epichlorhydrinharze mit durchschnittlichem Molekulargewicht ≤700)
· **IMDG**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Epoxide resin)
· **IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (epoxide resin)
· **Transport hazard class(es)**	
· **TDG, IMDG, IATA**	
· **Class**	9 Miscellaneous dangerous substances and articles.
· **Label**	9
· **Packing group**	
· **TDG, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	Yes Symbol (fish and tree)
· **Special marking (TDG):**	Symbol (fish and tree)

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· ***Special marking (IATA):***	*Symbol (fish and tree)*
· ***Special precautions for user***	*Warning: Miscellaneous dangerous substances and articles.*
· ***Danger code (Kemler):***	*90*
· ***EMS Number:***	*F-A,S-F*
· ***Transport in bulk according to Annex II of Marpol and the IBC Code***	*Not applicable.*
· ***Transport/Additional information:***	
· ***TDG***	
· ***Limited quantities (LQ)***	*5L*
· ***Transport category***	*3*
· ***Tunnel restriction code***	*E*
· ***UN "Model Regulation":***	*UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)), 9, III*

15 Regulatory information

· ***Safety, health and environmental regulations/legislation specific for the substance or mixture***
· ***GHS label elements***
The substance is classified and labelled according to the Globally Harmonised System (GHS).
· ***Hazard pictograms***

GHS07

· ***Signal word*** *Warning*

· ***Hazard-determining components of labelling:***
reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)
· ***Hazard statements***
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
· ***Precautionary statements***

P280	*Wear protective gloves/protective clothing/eye protection/face protection.*
P261	*Avoid breathing dust/fume/gas/mist/vapours/spray.*
P305+P351+P338	*IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.*
P321	*Specific treatment (see on this label).*
P333+P313	*If skin irritation or rash occurs: Get medical advice/attention.*
P501	*Dispose of contents/container in accordance with local/regional/national/international regulations.*

· ***National regulations:***

· ***Waterhazard class:*** *Water hazard class 2 (Assessment by list): hazardous for water.*
· ***Chemical safety assessment:*** *A Chemical Safety Assessment has been carried out.*

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16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· ***Department issuing SDS:*** *Abteilung Qualitätssicherung*
· ***Contact:*** *Fr. Dr. Bierögel*
· ***Abbreviations and acronyms:***
ICAO: International Civil Aviation Organisation
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Skin Irritation - Category 2: Skin corrosion/irritation, Hazard Category 2
Eye Irritation - Category 2: Serious eye damage/eye irritation, Hazard Category 2
Skin Sensitizer - Category 1: Sensitisation - Skin, Hazard Category 1
· **** Data compared to the previous version altered.***

Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 01/12/2011 Reviewed on 01/12/2011

1 Identification of the substance/mixture and of the company/undertaking

· **Product identifier**

· **Trade name: Epilox-Härter M 1093**
· **Relevant identified uses of the substance or mixture and uses advised against**
· **Application of the substance / the preparation** Hardening agent/ Curing agent

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
LEUNA-HARZE GmbH
Am Haupttor, Bau 6619
D-06237 Leuna
Telefon 03461 43 3639
e-Mail: infomsds.harze@leuna.de

· **Information department:**
Abteilung Qualitätssicherung
Dr. Karin Bierögel
Telefon 03461 43 4654
Telefax 03461 43 4574
Telefon außerhalb der Geschäftszeit: 03461 43 6188
· **Emergency telephone number:**
Leitstelle Werkfeuerwehr
03461 210007

2 Composition/information on ingredients

· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

9046-10-0	Polyoxyalkylenamin	C R34 H314	50-100%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

3 Hazards identification

· **Classification of the substance or mixture**

GHS05 Corrosion

H314 Causes severe skin burns and eye damage.

H303 May be harmful if swallowed.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

C; Corrosive

R34: Causes burns.
· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

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Trade name: Epilox-Härter M 1093

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· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**
C Corrosive

· **Hazard-determining components of labelling:**
Polyoxyalkylenamin

· **Risk phrases:**
34 Causes burns.

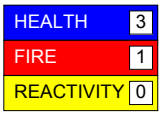
· **Safety phrases:**
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
60 This material and its container must be disposed of as hazardous waste.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**

Health = 3
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 3
Fire = 1
Reactivity = 0

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

4 First aid measures

· **Description of first aid measures**

· **General information:** Immediately remove any clothing soiled by the product.

· **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.

· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.

· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.

· **After swallowing:** Drink copious amounts of water and provide fresh air. Immediately call a doctor.

5 Firefighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray.
Use fire fighting measures that suit the environment.

· **Advice for firefighters**

· **Protective equipment:**
Wear self-contained respiatory protective device.
Wear fully protective suit.

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· **Additional information**
Collect contaminated fire fighting water separately. It must not enter the sewage system.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Keep people at a distance and stay upwind.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralizing agent.
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:** No special measures required.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Provide floor trough without outlet.
Store only in the original receptacle.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Store receptacle in a well ventilated area.
Keep receptacle tightly sealed.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**
· **Components with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· **Breathing equipment:** Not necessary if room is well-ventilated.

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· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**
PVC gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Use protective suit.

*
9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Pasty
Color:	Whitish
· **Odor:**	Ammonia-like
· **Change in condition**	
Boiling point/Boiling range:	260°C (500°F)
· **Flash point:**	> 100°C (> 212°F)
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Density:**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Not miscible or difficult to mix.
· **organic solvents:**	Soluble in many organic solvents.
· **Segregation coefficient (n-octonol/water):**	Not determined.
· **Solvent content:**	
Organic solvents:	0.0 %
Solids content:	48.0 %

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10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** Reacts with acids.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
9046-10-0 Polyoxyalkylenamin		
Oral	LD50	2880 mg/kg (rat)
Dermal	LD50	2980 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** Caustic effect on skin and mucous membranes.
· **on the eye:** Strong caustic effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Corrosive
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

12 Ecological information

· **Toxicity**

· **Acquatic toxicity:**	
9046-10-0 Polyoxyalkylenamin	
LC50/96h	> 220 mg/l (leuciscus idus)

· **Additional ecological information:**
· **General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
Danger to drinking water if even small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must be specially treated adhering to official regulations.
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

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Trade name: Epilox-Härter M 1093

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· **Uncleaned packagings:**
· **Recommendation:**
Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning.

14 Transport information

· **DOT regulations:**

· **Hazard class:** 8
· **Identification number:** UN2735
· **Packing group:** II
· **Proper shipping name (technical name):** POLYAMINES, LIQUID, CORROSIVE, N.O.S. (Epoxide resin hardener)
· **Label** 8

· **Land transport ADR/RID (cross-border):**

· **ADR/RID class:** 8 Corrosive substances
· **Danger code (Kemler):** 80
· **UN-Number:** 2735
· **Packaging group:** II

· **Maritime transport IMDG:**

· **IMDG Class:** 8
· **UN Number:** 2735
· **Label** 8
· **Packaging group:** II
· **EMS Number:** F-A,S-B
· **Marine pollutant:** No
· **Propper shipping name:** POLYAMINES, LIQUID, CORROSIVE, N.O.S. (Epoxide resin hardener)

· **Air transport ICAO-TI and IATA-DGR:**

· **ICAO/IATA Class:** 8
· **UN/ID Number:** 2735
· **Label** 8
· **Packaging group:** II
· **Propper shipping name:** POLYAMINES, LIQUID, CORROSIVE, N.O.S. (Epoxide resin hardener)

· **UN "Model Regulation":** UN2735, POLYAMINES, LIQUID, CORROSIVE, N.O.S., 8, II

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· **Special precautions for user** Warning: Corrosive substances

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredient is listed.

· **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **IARC (International Agency for Research on Cancer)**
None of the ingredients is listed.

· **NTP (National Toxicology Program)**
None of the ingredients is listed.

· **TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients is listed.

· **MAK (German Maximum Workplace Concentration)**
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
None of the ingredients is listed.

· **Product related hazard informations:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Hazard symbols:**
C Corrosive

· **Hazard-determining components of labelling:**
Polyoxyalkylenamin

· **Risk phrases:**
34 Causes burns.

· **Safety phrases:**
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

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Printing date 01/12/2011 Reviewed on 01/12/2011

Trade name: Epilox-Härter M 1093

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36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
60 This material and its container must be disposed of as hazardous waste.

· **National regulations:**

· **Water hazard class:** Water hazard class 2 (Self-assessment): hazardous for water.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Abteilung Qualitätssicherung
· **Contact:** Fr. Dr. Bierögel
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
· ***** Data compared to the previous version altered.**

Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 15.07.2015 *Version number 6* *Revision: 15.07.2015*

SECTION 1: Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**

· **Trade name: Epilox® M 996**

· **Article number:** 0513
· **CAS Number:**
25068-38-6
· **NLP Number:**
500-033-5
· **Index number:**
603-074-00-8
· **Registration number** 01-2119456619-26-0006
· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
· **Sector of Use**
SU19 Building and construction work
SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
· **Product category**
PC19 Intermediate
PC32 Polymer preparations and compounds
PC9a Coatings and paints, thinners, paint removers
PC0 Other
PC1 Adhesives, sealants
PC9b Fillers, putties, plasters, modelling clay
PC33 Semiconductors
· **Process category**
PROC19 Hand-mixing with intimate contact and only PPE available
PROC11 Non industrial spraying
PROC7 Industrial spraying
PROC3 Use in closed batch process (synthesis or formulation)
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC1 Use in closed process, no likelihood of exposure
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC6 Calendering operations
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC10 Roller application or brushing
PROC13 Treatment of articles by dipping and pouring
PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC24 High (mechanical) energy work-up of substances bound in materials and/or articles
· **Environmental release category**
ERC2 Formulation of preparations
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
ERC4 Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 Industrial use resulting in inclusion into or onto a matrix
ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
· **Article category**
AC2 Machinery, mechanical appliances, electrical/electronic articles
AC7 Metal articles

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Trade name: Epilox® M 996

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AC13 Plastic articles
AC4 Stone, plaster, cement, glass and ceramic articles
AC8 Paper articles
AC11 Wood articles
AC1 Vehicles
· ***Application of the substance / the mixture*** *Epoxy binder*

· ***1.3 Details of the supplier of the safety data sheet***
· ***Manufacturer/Supplier:***
LEUNA-Harze GmbH
Am Haupttor, Bau 6619
D-06237 Leuna
Telefon 03461 43 3639
e-Mail: infomsds.harze@leuna.de

· ***Further information obtainable from:***
Abteilung Qualitätssicherung
Dr. Karin Bierögel
Telefon 03461 43 4654
Telefax 03461 43 4574
Telefon außerhalb der Geschäftszeit: 03461 43 6188
· ***1.4 Emergency telephone number:***
Leitstelle Werkfeuerwehr
03461 434333

*
SECTION 2: Hazards identification

· ***2.1 Classification of the substance or mixture***
· ***Classification according to Regulation (EC) No 1272/2008***

GHS09 environment

Aquatic Chronic 2 H411 Toxic to aquatic life with long lasting effects.

GHS07

Skin Irrit. 2	*H315 Causes skin irritation.*
Eye Irrit. 2	*H319 Causes serious eye irritation.*
Skin Sens. 1	*H317 May cause an allergic skin reaction.*

· ***2.2 Label elements***
· ***Labelling according to Regulation (EC) No 1272/2008***
The substance is classified and labelled according to the CLP regulation.
· ***Hazard pictograms***

GHS07 GHS09

· ***Signal word*** *Warning*

· ***Hazard-determining components of labelling:***
reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)
· ***Hazard statements***
H315 Causes skin irritation.
H319 Causes serious eye irritation.

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H317 May cause an allergic skin reaction.
H411 Toxic to aquatic life with long lasting effects.
· ***Precautionary statements***
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P262 Do not get in eyes, on skin, or on clothing.
P273 Avoid release to the environment.
P264 Wash thoroughly after handling.
· ***Additional information:***
Contains epoxy constituents. May produce an allergic reaction.
· ***2.3 Other hazards***
· ***Results of PBT and vPvB assessment***
· ***PBT:*** *Not applicable.*
· ***vPvB:*** *Not applicable.*

SECTION 3: Composition/information on ingredients

· ***3.1 Chemical characterisation: Substances***
· ***CAS No. Description***
25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin
(number average molecular weight = 700)
· ***Identification number(s)***
· ***NLP Number:*** *500-033-5*
· ***Index number:*** *603-074-00-8*

SECTION 4: First aid measures

· ***4.1 Description of first aid measures***
· ***After inhalation:*** *Supply fresh air; consult doctor in case of complaints.*
· ***After skin contact:***
If skin irritation continues, consult a doctor.
Immediately wash with water and soap and rinse thoroughly.
· ***After eye contact:***
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· ***After swallowing:***
If symptoms persist consult doctor.
Rinse out mouth and then drink plenty of water.
· ***4.2 Most important symptoms and effects, both acute and delayed*** *No further relevant information available.*
· ***4.3 Indication of any immediate medical attention and special treatment needed***
No further relevant information available.

SECTION 5: Firefighting measures

· ***5.1 Extinguishing media***
· ***Suitable extinguishing agents:***
CO2, powder or water spray. Fight larger fires with water spray.
Use fire extinguishing methods suitable to surrounding conditions.
· ***5.2 Special hazards arising from the substance or mixture***
Carbon monoxide (CO)
Under certain fire conditions, traces of other toxic gases cannot be excluded, e.g.:
· ***5.3 Advice for firefighters***
· ***Protective equipment:***
Wear self-contained respiratory protective device.
Wear fully protective suit.
· ***Additional information***
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

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Collect contaminated fire fighting water separately. It must not enter the sewage system.

SECTION 6: Accidental release measures

· ***6.1 Personal precautions, protective equipment and emergency procedures***
Wear protective equipment. Keep unprotected persons away.
· ***6.2 Environmental precautions:***
Do not allow to penetrate the ground/soil.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· ***6.3 Methods and material for containment and cleaning up:***
Dispose contaminated material as waste according to item 13.
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
· ***6.4 Reference to other sections***
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

· ***7.1 Precautions for safe handling*** *Ensure good ventilation/exhaustion at the workplace.*
· ***Information about fire - and explosion protection:*** *No special measures required.*

· ***7.2 Conditions for safe storage, including any incompatibilities***
· ***Storage:***
· ***Requirements to be met by storerooms and receptacles:*** *Prevent any seepage into the ground.*
· ***Information about storage in one common storage facility:*** *Not required.*
· ***Further information about storage conditions:***
Store in cool, dry conditions in well sealed receptacles.
Store receptacle in a well ventilated area.
· ***7.3 Specific end use(s)*** *No further relevant information available.*

SECTION 8: Exposure controls/personal protection

· ***Additional information about design of technical facilities:*** *No further data; see item 7.*

· ***8.1 Control parameters***
· ***Ingredients with limit values that require monitoring at the workplace:*** *Not required.*
· ***DNELs***
Dermal: 8,33 mg/kg bw/day
Inhalation: 12,25 mg/m³
· ***PNECs***
STP: 10 mg/l
Freshwater: 0,006 mg/l
Freshwater sediment: 0,0627 mg/kg wwt
Marine water: 0,0006 mg/l
Marine water sediment: 0,00627 mg/kg wwt
Soil: 0,0478 mg/kg wwt
· ***Additional information:*** *The lists valid during the making were used as basis.*

· ***8.2 Exposure controls***
· ***Personal protective equipment:***
· ***General protective and hygienic measures:***
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.

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· ***Respiratory protection:***
Filter A/P2
Use suitable respiratory protective device only when aerosol or mist is formed.
· ***Protection of hands:***

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· ***Material of gloves***
Recommended thickness of the material: ≥ 0.4 mm
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
Butyl rubber, BR
Nitrile rubber, NBR
· ***Penetration time of glove material***
The determined penetration times according to EN 374 part III are not performed under practical conditions.
Therefore a maximum wearing time, which corresponds to 50% of the penetration time, is recommended.
· ***Eye protection:***

Tightly sealed goggles

· ***Body protection:*** *Protective work clothing*

SECTION 9: Physical and chemical properties

· ***9.1 Information on basic physical and chemical properties***	
· ***General Information***	
· ***Appearance:***	
Form:	*Viscous*
Colour:	*Light yellow*
· ***Odour:***	*Nearly odourless*
· ***Change in condition***	
Melting point/Melting range:	*30 - 50 °C*
Boiling point/Boiling range:	*> 320 °C (DSC)*
Solidification point:	*- 16 °C (TG)*
· ***Flash point:***	*266 °C (EU A.9)*
· ***Ignition temperature:***	*455 °C*
· ***Danger of explosion:***	*Product does not present an explosion hazard.*
· ***Vapour pressure at 25 °C:***	*0.0000046 hPa*
· ***Density at 20 °C:***	*1.17 g/cm³*
· ***Solubility in / Miscibility with***	
water at 20 °C:	*0.0069 g/l*
· ***organic solvents:***	*Miscible with many organic solvents.*
· ***Partition coefficient (n-octanol/water) at 25 °C:***	*3.242 log POW (modified shake flask test)*
· ***Viscosity:***	
Dynamic at 60 °C:	*> 3 Pa.s*

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· **9.2 Other information** No further relevant information available.

SECTION 10: Stability and reactivity

· **10.1 Reactivity** No further relevant information available.
· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **10.3 Possibility of hazardous reactions**
Exothermic polymerisation.
Reacts with amines.
Reacts with acids.
Reacts with alkali (lyes).
· **10.4 Conditions to avoid** No further relevant information available.
· **10.5 Incompatible materials:** No further relevant information available.
· **10.6 Hazardous decomposition products:** Irritant gases/vapours

SECTION 11: Toxicological information

· **11.1 Information on toxicological effects**
· **Acute toxicity**

· **LD/LC50 values relevant for classification:**

25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)

Oral	LD50	15 000 mg/kg bw (Rat)
Dermal	LD50	23 000 mg/kg bw (rabbit)

· **Primary irritant effect:**
· **Skin corrosion/irritation**
Causes skin irritation.
· **Serious eye damage/irritation**
Causes serious eye irritation.
· **Respiratory or skin sensitisation**
May cause an allergic skin reaction.
· **Repeated dose toxicity**
NOAEL (oral): 50 mg/kg bw/day
NOEAL (dermal): 100 mg/kg bw/day
· **CMR effects (carcinogenity, mutagenicity and toxicity for reproduction)**
· **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
· **Carcinogenicity** Based on available data, the classification criteria are not met.
· **Reproductive toxicity** Based on available data, the classification criteria are not met.
· **STOT-single exposure** Based on available data, the classification criteria are not met.
· **STOT-repeated exposure** Based on available data, the classification criteria are not met.
· **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

· **12.1 Toxicity**

· **Aquatic toxicity:**

25068-38-6 reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight = 700)

EC50/48h	1.8 mg/l (daphnia)
EC50/72h	11 mg/l (Alg)
LC50/96h	2.0 mg/l (leuciscus idus)

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· ***12.2 Persistence and degradability*** *No further relevant information available.*
· ***Other information:*** *The product is difficultly biodegradable.*
· ***12.3 Bioaccumulative potential*** *No further relevant information available.*
· ***12.4 Mobility in soil*** *No further relevant information available.*
· ***Ecotoxical effects:***
· ***Remark:*** *Toxic for fish*
· ***Additional ecological information:***
· ***General notes:***
Water hazard class 2 (German Regulation) (Assessment by list): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Toxic for aquatic organisms
· ***12.5 Results of PBT and vPvB assessment***
· ***PBT:*** *Not applicable.*
· ***vPvB:*** *Not applicable.*
· ***12.6 Other adverse effects*** *No further relevant information available.*

SECTION 13: Disposal considerations

· ***13.1 Waste treatment methods***
· ***Recommendation*** *Must be specially treated adhering to official regulations.*

· ***Uncleaned packaging:***
· ***Recommendation:***
Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

SECTION 14: Transport information

· ***14.1 UN-Number***	
· ***ADR, IMDG, IATA***	*3082*
· ***14.2 UN proper shipping name***	
· ***ADR, IMDG, IATA***	*ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (epoxide resin)*
· ***14.3 Transport hazard class(es)***	
· ***ADR, IMDG, IATA***	
· ***Class***	*9 Miscellaneous dangerous substances and articles.*
· ***Label***	*9*
· ***14.4 Packing group***	
· ***ADR, IMDG, IATA***	*III*
· ***14.5 Environmental hazards:***	
· ***Marine pollutant:***	*Yes* *Symbol (fish and tree)*
· ***Special marking (ADR):***	*Symbol (fish and tree)*
· ***Special marking (IATA):***	*Symbol (fish and tree)*
· ***14.6 Special precautions for user***	*Warning: Miscellaneous dangerous substances and articles.*

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· **Danger code (Kemler):**	90
· **14.7 Transport in bulk according to Annex II of Marpol and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **ADR**	
· **Limited quantities (LQ)**	LQ7
· **Transport category**	3
· **Tunnel restriction code**	E
· **UN "Model Regulation":**	UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., 9, III

SECTION 15: Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **National regulations:**

· **Waterhazard class:** Water hazard class 2 (Assessment by list): hazardous for water.
· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Abteilung Qualitätssicherung
· **Contact:** Fr. Dr. Bierögel
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organisation
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2
Skin Sens. 1: Sensitisation - Skin, Hazard Category 1
Aquatic Chronic 2: Hazardous to the aquatic environment - Chronic Hazard, Category 2
· *** Data compared to the previous version altered.**

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*
Annex: Exposure scenario

· ***Short title of the exposure scenario*** *Epilox® M 996*
· ***Sector of Use***
SU19 Building and construction work
SU17 General manufacturing, e.g. machinery, equipment, vehicles, other transport equipment
SU10 Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
· ***Product category***
PC19 Intermediate
PC32 Polymer preparations and compounds
PC9a Coatings and paints, thinners, paint removers
PC0 Other
PC1 Adhesives, sealants
PC9b Fillers, putties, plasters, modelling clay
PC33 Semiconductors
· ***Process category***
PROC19 Hand-mixing with intimate contact and only PPE available
PROC11 Non industrial spraying
PROC7 Industrial spraying
PROC3 Use in closed batch process (synthesis or formulation)
PROC4 Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC1 Use in closed process, no likelihood of exposure
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC6 Calendering operations
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC10 Roller application or brushing
PROC13 Treatment of articles by dipping and pouring
PROC14 Production of preparations or articles by tabletting, compression, extrusion, pelletisation
PROC24 High (mechanical) energy work-up of substances bound in materials and/or articles
· ***Article category***
AC2 Machinery, mechanical appliances, electrical/electronic articles
AC7 Metal articles
AC13 Plastic articles
AC4 Stone, plaster, cement, glass and ceramic articles
AC8 Paper articles
AC11 Wood articles
AC1 Vehicles
· ***Environmental release category***
ERC2 Formulation of preparations
ERC6a Industrial use resulting in manufacture of another substance (use of intermediates)
ERC4 Industrial use of processing aids in processes and products, not becoming part of articles
ERC5 Industrial use resulting in inclusion into or onto a matrix
ERC8c Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8f Wide dispersive outdoor use resulting in inclusion into or onto a matrix
· ***Notes***
Do not use for private / domestic purposes (household).
The product is not intended for private use.
· ***Description of the activities / processes covered in the Exposure Scenario***
See full text of the descriptors in section 1.
· ***Conditions of use*** *Customary application according to section 1.*

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· ***Duration and frequency*** *5 workdays/week.*
· ***Worker*** *8hrs (full working shift).*
· ***Environment*** *The product must not enter the sewage system or the aquatic environment.*
· ***Physical parameters***
The data on the physical - chemical properties in the Exposure Scenario is based on the properties of the preparation.
· ***Physical state*** *Fluid*
· ***Concentration of the substance in the mixture*** *The substance is main component.*
· ***Used amount per time or activity*** *According to directions for use.*
· ***Other operational conditions*** *Observe the general safety regulations when handling chemicals.*
· ***Other operational conditions affecting environmental exposure***
Observe section 6 of the Safety Data Sheet (Accidental release measures).
Use only on hard ground.
· ***Other operational conditions affecting worker exposure***
Avoid contact with the skin, eyes and clothing.
Indoor application.
Outdoor application.
Avoid contact with eyes.
Avoid contact with the skin.
Avoid long-term or repeated skin contact.
· ***Other operational conditions affecting consumer exposure*** *Keep out of the reach of children.*
· ***Other operational conditions affecting consumer exposure during the use of the product*** *Not applicable.*
· ***Risk management measures***
· ***Worker protection***
· ***Organisational protective measures*** *No special measures required.*
· ***Technical protective measures***
Ensure good ventilation/exhaustion at the workplace.
Store in cool, dry place in tightly closed receptacles.
Use product only in enclosed systems.
Ensure that suitable extractors are available on processing machines
· ***Personal protective measures***
Avoid contact with the eyes and skin.
The usual precautionary measures are to be adhered to when handling chemicals.
Store protective clothing separately.
Keep away from foodstuffs, beverages and feed.
Do not inhale gases / fumes / aerosols.
Avoid contact with the skin.
Avoid contact with the eyes.
Tightly sealed goggles
Protective gloves
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· ***Measures for consumer protection***
Ensure adequate labelling.
Keep locked up and out of the reach of children.
· ***Environmental protection measures***
Avoid release to the environment. Obtain special instructions / refer to Safety Data Sheet.
· ***Air*** *No special measures required.*
· ***Water***
Do not allow to reach ground water, water bodies or sewage system.
Do not allow to reach sewage system.
· ***Soil*** *Prevent contamination of soil.*
· ***Notes*** *In case of unintended release of the product: See section 6 of the Safety Data Sheet.*
· ***Disposal measures***
Forward for special waste incineration in compliance with local legal provisions.
Ensure that waste is collected and contained.
· ***Disposal procedures***
Product residues are incinerated as special waste.

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Must not be disposed together with household garbage. Do not allow product to reach sewage system.

· ***Waste type*** *Liquid product residues*
· ***Exposure estimation***
· ***Worker (dermal)***
The exposure estimation was carried out in accordance with ECETOC TRA.
The calculated value is smaller than the DNEL.
· ***Worker (inhalation)***
The exposure estimation was carried out in accordance with ECETOC TRA.
The calculated value is smaller than the DNEL.
· ***Environment*** *The calculated value is smaller than the PNEC.*
· ***Consumer*** *Not relevant for this Exposure Scenario.*
· ***Guidance for downstream users*** *No further relevant information available.*

SAFETY DATA SHEET

Date of issue/Date of revision 26 May 2015
Version 3

Section 1. Identification

Product name : Fiber Glass Continuous Filament

Product code : 01014

Other means of identification : Product Family: Product Name:
Chopped Strand: ChopVantage®, ChopVantage® XM, ChopVantage® HP, ChopVantage® XM HP, Delta Chop®, Chopped Strands for Nonwovens
Direct Draw: HYBON®, TUFRov®, InnoFiber® NTY, LFT4000, LFT9000
Yarn: FiberGlass Yarn, L.E.X.® Yarn, TEXO® Yarn, InnoFiber® DCS
Mat: Chopped Strand Mat, MatVantage® II
Roving: Roving for Continuous Laminating, Roving for Pultrusion/Filament Winding, Roving for SMC, HYBON® Roving for Spray Up, HYBON® Woven Roving, PREFORMANCE™ ROVING
INNOFIBER®: CR, HP, LD, TS, XM
Insulation: Texo® HTM Mat
Recycled Products: Chop/Open ESM, Chop/Open Plastic Reinforcement, Chop/Open 10 micron, Chop/Open 900, Reject Roving, Reject Chopped Strand

Product type : Article

Relevant identified uses of the substance or mixture and uses advised against

Product use : Industrial applications.

Use of the substance/ mixture : Industrial applications

Uses advised against : None identified.

Supplier : PPG Industries, Inc.
One PPG Place
Pittsburgh, PA 15272

PPG INDUSTRIES FIBER GLASS B.V.
Energieweg 3
NL 9608 PZ Westerbroek
The Netherlands
Telephone: 31 598 313 633 / 31 598 313 911 (24h/24h) PPG Fiber Glass EMEA Service Center/Centre

Emergency telephone number : (412) 434-4515 (U.S.)

Technical Phone Number : 1-800-432-7073 ext. 302 (Fiber Glass)

Section 2. Hazards identification

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture : Not classified.

GHS label elements

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Supplemental label elements : Emits toxic fumes when heated.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Article

Product name : Fiber Glass Continuous Filament

Other means of identification : Product Family: Product Name:
Chopped Strand: ChopVantage®, ChopVantage® XM, ChopVantage® HP, ChopVantage® XM HP, Delta Chop®, Chopped Strands for Nonwovens
Direct Draw: HYBON®, TUFRov®, InnoFiber® NTY, LFT4000, LFT9000
Yarn: FiberGlass Yarn, L.E.X.® Yarn, TEXO® Yarn, InnoFiber® DCS
Mat: Chopped Strand Mat, MatVantage® II
Roving: Roving for Continuous Laminating, Roving for Pultrusion/Filament Winding, Roving for SMC, HYBON® Roving for Spray Up, HYBON® Woven Roving, PREFORMANCE™ ROVING
INNOFIBER®: CR, HP, LD, TS, XM
Insulation: Texo® HTM Mat
Recycled Products: Chop/Open ESM, Chop/Open Plastic Reinforcement, Chop/Open 10 micron, Chop/Open 900, Reject Roving, Reject Chopped Strand

Ingredient name	%	CAS number
glass, oxide, chemicals	95	65997-17-3
Organic Surface Binder/Sizing	5	Not available.

Some Fiberglass products contain Textured Polyester Filament Yarn

SUB codes represent substances without registered CAS Numbers.

Section 3. Composition/information on ingredients

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

Description of necessary first aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. If irritation persists, seek medical attention.

Inhalation : None known.

Skin contact : Remove contaminated clothing and shoes. Gently wash with plenty of soap and water. If irritation persists, seek medical attention. If glass fiber becomes embedded, get medical attention.

Ingestion : Not a likely route of exposure.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Dusts from this product may cause temporary mechanical irritation.

Inhalation : Dusts from this product may cause mechanical irritation of the nose, throat and respiratory tract.

Skin contact : Dusts from this product may cause temporary mechanical irritation.

Ingestion : Although ingestion of this product is not likely to occur in industrial applications, accidental ingestion may cause illness or irritation of the mouth and gastrointestinal tract.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : No specific fire or explosion hazard. Material is not an electrical conductor and may accumulate static charge.

Hazardous thermal decomposition products : Fiberglass will not burn, but smoking of the product may occur at approximately 400 - 500 °F (approximately 200 - 260 °C) due to decomposition of the surface binder. Surface binders may decompose in a fire situation and release carbon monoxide, carbon dioxide and water. Additionally, there are many chemicals that can evolve during any partial decomposition of chemical products. The amounts or identities cannot be predicted and can differ in each situation.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fiberglass itself will not support combustion, but in a sustained fire, proper protection against products of combustion from the fuel and sizing/binder must be worn.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No special protection is required.

For emergency responders : No special protection is required.

Environmental precautions : Fiberglass is generally considered to be an inert solid waste. No special precautions are needed in case of a release or spill.

Methods and materials for containment and cleaning up

Small spill : Vacuum or sweep up material and place in a designated, labeled waste container.

Large spill : Vacuum or sweep up material and place in a designated, labeled waste container.

Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Synthetic vitreous fibers	**OSHA PEL (United States).** TWA: 15 mg/m³ TWA: 5 mg/m³ Form: Respirable TWA: 15 mg/m³ Form: Total dust **ACGIH TLV (United States).** TWA: 1 f/cc Form: Continuous filament glass fibers TWA: 5 mg/m³, (Inhalable) Form: Continuous filament glass fibers TWA: 3 mg/m³ Form: Respirable TWA: 10 mg/m³ Form: Total dust **ACGIH TLV (United States, 6/2013).** TWA: 5 mg/m³ 8 hours. Form: Inhalable fraction TWA: 1 f/cc 8 hours. Form: Respirable fibers: length greater than 5 uM; aspect ratio equal to or greater than 3:1 as determined by the membrane filter method at 400-450X magnification (4-mm objective) phase contrast illumination.

Key to abbreviations

A	=	Acceptable Maximum Peak	S	=	Potential skin absorption
ACGIH	=	American Conference of Governmental Industrial Hygienists.	SR	=	Respiratory sensitization
C	=	Ceiling Limit	SS	=	Skin sensitization
F	=	Fume	STEL	=	Short term Exposure limit values
IPEL	=	Internal Permissible Exposure Limit	TD	=	Total dust
OSHA	=	Occupational Safety and Health Administration.	TLV	=	Threshold Limit Value
R	=	Respirable	TWA	=	Time Weighted Average
Z	=	OSHA 29CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances			

Consult local authorities for acceptable exposure limits.

Section 8. Exposure controls/personal protection

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Good personal hygiene and the use of barrier creams, caps, protective gloves, cotton coveralls or long sleeved loose fitting clothing will maximize comfort. Appropriate techniques should be used to remove potentially contaminated clothing. Work clothing should be laundered separately from other clothing before reuse. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety glasses with side shields.

Skin protection

Hand protection : Use gloves to protect against physical irritation or injury if required by handling conditions.

Body protection : Wear clean, body-covering clothing.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : If dust is generated and ventilation is inadequate, use respirator that will protect against dust/mist. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Solid.

Color : White to yellowish.

Odor : Odorless.

Odor threshold : Not available.

pH : Not available.

Melting point : Not available.

Boiling point : Not available.

Flash point : Closed cup: Not applicable. [Product does not sustain combustion.]

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

Section 9. Physical and chemical properties

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Evaporation rate : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 2.65 to 2.7

Solubility : Insoluble

Partition coefficient: n-octanol/water : Not available.

Viscosity : Not applicable.

Volatility : 0% (v/v), 0% (w/w)

% Solid. (w/w) : 100

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : When exposed to high temperatures may produce hazardous decomposition products. Refer to protective measures listed in sections 7 and 8.

Incompatible materials : None known.

Hazardous decomposition products : Fiberglass products may release small amounts of acetic acid and other organic materials at elevated temperatures.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Irritation/Corrosion

Conclusion/Summary

Skin : No known significant effects or critical hazards.

Eyes : No known significant effects or critical hazards.

Respiratory : No known significant effects or critical hazards.

Sensitization

Conclusion/Summary

Section 11. Toxicological information

Skin : No known significant effects or critical hazards.

Respiratory : No known significant effects or critical hazards.

Mutagenicity

Conclusion/Summary : No known significant effects or critical hazards.

Carcinogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Classification

Product/ingredient name	OSHA	IARC	NTP
glass, oxide, chemicals	-	3	-

Carcinogen Classification code:

IARC: 1, 2A, 2B, 3, 4
NTP: Known to be a human carcinogen; Reasonably anticipated to be a human carcinogen
OSHA: +
Not listed/not regulated: -

Reproductive toxicity

Conclusion/Summary : No known significant effects or critical hazards.

Teratogenicity

Conclusion/Summary : No known significant effects or critical hazards.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Target organs : Contains material which may cause damage to the following organs: upper respiratory tract, skin, eyes.

Aspiration hazard

Not available.

Information on the likely routes of exposure

Potential acute health effects

Eye contact : Dusts from this product may cause temporary mechanical irritation.

Inhalation : Dusts from this product may cause mechanical irritation of the nose, throat and respiratory tract.

Skin contact : Dusts from this product may cause temporary mechanical irritation.

Ingestion : Although ingestion of this product is not likely to occur in industrial applications, accidental ingestion may cause illness or irritation of the mouth and gastrointestinal tract.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Section 11. Toxicological information

Conclusion/Summary : There are no known health effects from the long term use or contact with nonrespirable continuous filament fibers, which is the type of fiberglass that PPG produces. Nonrespirable fibers cannot reach the deep lung because they have a diameter of greater than 3.5 micrometers. Fibers of this diameter cannot penetrate the narrow, bending passages of the human respiratory tract to reach the lower regions of the lung and thus, have no possibility of causing serious pulmonary damage. Instead, they deposit on the surfaces of the upper respiratory tract, nose, or pharynx. These fibers are then cleared through normal physiological mechanisms.

Animal Study: In 2000, the Institute of Occupational Medicine (IOM) in Scotland published the results of a long term inhalation study in animals exposed to fibers that were manufactured to be RESPIRABLE. Animals were exposed to a very high concentration of these RESPIRABLE fibers (1022 fibers/cc for 5 hours/day, 7 days/week for 52 weeks). Exposure to these microfibers resulted in the development of fibrosis, lung cancer and mesothelioma as a result of the fibers being able to reach the lower regions of the lung.

Chopped, crushed or severely mechanically processed fiberglass may contain a very small amount of respirable fibers that could reach the deep lung. The measured airborne concentration of these respirable fibers in areas where severe processing of fiberglass occurred has been shown to be extremely low and well below the TLV. Repeated or prolonged exposure to respirable glass fibers may cause fibrosis, lung cancer and mesothelioma. PPG fiberglass, in the form supplied, does not contain respirable fibers.

Epidemiology Studies: Two major studies in the US (performed by the University of Pittsburgh) and Europe (performed by the International Agency for Research on Cancer) showed no increase in lung cancer or respiratory disease among people working in production facilities producing NONRESPIRABLE continuous filament fiberglass. An additional smaller study performed in Canada also did not show an association between exposure of workers to fiberglass and respiratory cancer.

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Section 11. Toxicological information

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees. Section 6. Accidental release measures

14. Transport information

	DOT	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class (es)	-	-	-
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Marine pollutant substances	Not applicable.	Not applicable.	Not applicable.

14. Transport information

Additional information

DOT : None identified.
IMDG : None identified.
IATA : None identified.

Special precautions for user : -

Section 15. Regulatory information

United States inventory (TSCA 8b) : All components are listed or exempted.
Australia inventory (AICS) : All components are listed or exempted.
Canada inventory (DSL) : All components are listed or exempted.
China inventory (IECSC) : All components are listed or exempted.
Europe inventory (REACH) : Please contact your supplier for information on the inventory status of this material.
Japan inventory (ENCS) : All components are listed or exempted.
Korea inventory (KECI) : All components are listed or exempted.
New Zealand (NZIoC) : All components are listed or exempted.
Philippines inventory (PICCS) : All components are listed or exempted.

United States

SARA 302/304

SARA 304 RQ : Not applicable.

Composition/information on ingredients

No products were found.

SARA 311/312

Classification : Not applicable.

Composition/information on ingredients

No products were found.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health : 1 **Flammability** : 0 **Physical hazards** : 0

(*) - Chronic effects

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Health : 1 **Flammability** : 0 **Instability** : 0

Other information : the PPG logo is a registered trademark of PPG Industries Ohio, Inc.

Section 16. Other information

Date of previous issue : **5/26/2015.**

Organization that prepared the MSDS : EHS

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Indicates information that has changed from previously issued version.

Disclaimer

The information contained in this data sheet is based on present scientific and technical knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by PPG, and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee is given in respect of the properties of the products. No liability can be accepted for any failure to observe the precautionary measures described in this data sheet or for any misuse of the products.

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 28.04.2010 *Revision: 28.04.2010*

1 Identification of the substance/preparation and of the company/undertaking

Trade name: ***FLUGROSTENTFERNER*** ***RL Nr. 23 (Rust film remover)***

Application of the substance / the preparation *Cleaning material/ Detergent*

Manufacturer/Supplier:
Tegee-Chemie Bremen GmbH
Bergedorfer Straße 6-8
D-28219 Bremen

Further information obtainable from:
R&D +49 421 389970
e-mail: info@tegee-rumler.eu

Information in case of emergency:
During normal opening times: +49 421 38997-38 (62)
At other times: +49 172 9277170

2 Hazards identification

Hazard description:
Xi Irritant
Information concerning particular hazards for human and environment:
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
R 36/38 Irritating to eyes and skin.
Classification system:
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.
NFPA-Ratings for USA
Health = 1
Flammability = 0
Reactivity = 0
HMIS-Ratings for USA
Health = 1
Flamability = 0
Reactivity = 0

3 Composition/information on ingredients

Chemical characterization
Description: *Mixture: consisting of the following components.*

Dangerous components:

CAS: 6153-56-6 *oxalic acid-2-hydrate* *1-5%*
Xn; R 21/22

CAS: 7664-38-2 *phosphoric acid* *1-5%*
EINECS: 231-633-2 C; R 34

CAS: 68411-30-3 *Benzenesulfonic acid, linear alkyl, sodium salt* *0.1-1%*
EINECS: 270-115-0 Xn, Xi; R 22-36/38

Regulation (EC) No 648/2004 on detergents / Labelling for contents

anionic surfactants
< 5%

Additional information: *For the wording of the listed risk phrases refer to section 16.*

4 First-aid measures

After inhalation: *Supply fresh air.*
After skin contact: *Immediately wash with water and soap and rinse thoroughly.*

(Contd. on page 2)

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 28.04.2010 *Revision: 28.04.2010*

Trade name: FLUGROSTENTFERNER RL Nr. 23 (Rust film remover)

(Contd. of page 1)

After eye contact: *Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.*
After swallowing: *If symptoms persist consult doctor.*

*
5 Fire-fighting measures

Suitable extinguishing agents:
CO2, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
For safety reasons unsuitable extinguishing agents: *Water with full jet*
Special hazards caused by the substance, its products of combustion or resulting gases:
In case of fire, the following can be released:
Carbon monoxide (CO)
Sulphur dioxide (SO2)
Protective equipment: *No special measures required.*

6 Accidental release measures

Person-related safety precautions: *Wear protective clothing.*
Measures for environmental protection: *Do not allow to penetrate the ground/soil.*
Measures for cleaning/collecting:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Additional information:
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling:
Information for safe handling: *Keep receptacles tightly sealed.*
Information about fire - and explosion protection: *No special measures required.*

Storage:
Requirements to be met by storerooms and receptacles: *Store only in the original receptacle.*
Information about storage in one common storage facility: *Store away from foodstuffs.*
Further information about storage conditions: *Store under lock and key and out of the reach of children.*

*
8 Exposure controls/personal protection

Additional information about design of technical facilities: *No further data; see item 7.*

Ingredients with limit values that require monitoring at the workplace:

7664-38-2 phosphoric acid

WEL Short-term value: 2 mg/m³
Long-term value: 1 mg/m³
Additional information: *The lists valid during the making were used as basis.*

Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures are to be adhered to when handling chemicals.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Avoid contact with the eyes and skin.
Use skin protection cream for skin protection.
Respiratory protection: *Not required.*
Protection of hands: *Protective gloves*

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Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 28.04.2010 *Revision: 28.04.2010*

Trade name: FLUGROSTENTFERNER RL Nr. 23 (Rust film remover)

(Contd. of page 2)

Material of gloves
Rubber gloves
Fluorocarbon rubber (Viton)
Nitrile rubber, NBR
Recommended thickness of the material: ≥ 0.4 mm
Penetration time of glove material
Value for the permeation: Level ≥ 480 min
The determined penetration times according to EN 374 part III are not performed under practical conditions. Therefore a maximum wearing time, which corresponds to 50% of the penetration time, is recommended.
Eye protection: *Safety glasses*

9 Physical and chemical properties

General Information

Form:	*Fluid*
Colour:	*Transparent*
Odour:	*Characteristic*

Change in condition

Melting point/Melting range:	*0°C*
Boiling point/Boiling range:	*100°C*
Flash point:	*Not applicable*
Flammability (solid, gaseous):	*Void*
Ignition temperature:	*Void*
Decomposition temperature:	*Not determined*
Self-igniting:	*Product is not selfigniting.*
Danger of explosion:	*Product does not present an explosion hazard.*

Explosion limits:

Lower:	*Not applicable*
Upper:	*Not applicable*
Oxidizing properties	*Void*
Vapour pressure:	*Not determined*
Density at 20°C:	*1.02 g/cm³*

Solubility in / Miscibility with water: *Fully miscible.*

pH-value at 20°C:	*1.4*

Viscosity:

Dynamic at 20°C:	*1200 mPas*

Solvent content:

Organic solvents:	*0.0 %*

10 Stability and reactivity

Thermal decomposition / conditions to be avoided: *No decomposition if used according to specifications.*
Materials to be avoided:
Dangerous reactions *No dangerous reactions known.*
Dangerous decomposition products: *No dangerous decomposition products known.*

(Contd. on page 4)

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 28.04.2010 *Revision: 28.04.2010*

Trade name: ***FLUGROSTENTFERNER RL Nr. 23 (Rust film remover)***

(Contd. of page 3)

11 Toxicological information

Acute toxicity:
Primary irritant effect:
on the skin: *Irritant to skin and mucous membranes.*
on the eye: *Irritating effect.*
Sensitization: *No sensitizing effects known.*
Additional toxicological information:
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Irritant

12 Ecological information

Additional ecological information:
General notes:
Must not reach sewage water or drainage ditch undiluted or unneutralized.
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water
Rinse off of bigger amounts into drains or the aquatic environment may lead to decreased pH-values. A low pH-value harms aquatic organisms. In the dilution of the use-level the pH-value is considerably increased, so that after the use of the product the aqueous waste, emptied into drains, is only low water-dangerous.
The product does not contain organic complexing agents.
The product does not contain organically bounded halogens (AOX-free).

13 Disposal considerations

Product:
Recommendation
Dilute concentrate with water and neutralize afterwards with suitable alkali material (sodium hydroxide solution, lime).
The formed neutral salts are relatively environment-friendly.
European waste catalogue
07 06 01 aqueous washing liquids and mother liquors

Uncleaned packaging:
Recommendation:
Packaging may be reused or recycled after cleaning.
Disposal must be made according to official regulations.
Recommended cleansing agents: *Water, if necessary together with cleansing agents.*

14 Transport information

Land transport ADR/RID (cross-border)
ADR/RID class: -

Maritime transport IMDG:
IMDG Class: -
Marine pollutant: *No*

Air transport ICAO-TI and IATA-DGR:
ICAO/IATA Class: -

15 Regulatory information

TSCA (Toxic Substances Control Act)
7664-38-2 phosphoric acid

(Contd. on page 5)

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 28.04.2010 *Revision: 28.04.2010*

Trade name: FLUGROSTENTFERNER RL Nr. 23 (Rust film remover)

(Contd. of page 4)

Labelling according to EU guidelines: 1999/45/EU
The product has been marked in accordance with EU Directives / respective national laws.

Code letter and hazard designation of product:
Xi Irritant

Hazard-determining components of labelling:
oxalic acid-2-hydrate
phosphoric acid

Risk phrases:
36/38 Irritating to eyes and skin.

Safety phrases:
2 Keep out of the reach of children.
26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
28 After contact with skin, wash immediately with plenty of water.
37/39 Wear suitable gloves and eye/face protection.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Relevant R-phrases
21/22 Harmful in contact with skin and if swallowed.
22 Harmful if swallowed.
34 Causes burns.
36/38 Irritating to eyes and skin.

Department issuing MSDS: *R&D*

Contact:
+49 421 38997 38
+49 421 38997 62

**** Data compared to the previous version altered.***

Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

CHEVRON and TEXACO REGULAR UNLEADED GASOLINES

Product Use: Fuel
Product Number(s): 201000, 204039, 204054, 204067, 204086, 204139, 204153, 204585, 204750, 204751 [See Section 16 for Additional Product Numbers]
Synonyms: Calco Regular Unleaded Gasoline, Chevron Regular Unleaded Gasoline, Chevron UL/CQ Gasoline, Gasolines, Automotive, Texaco Unleaded Gasoline
Company Identification
Chevron Products Company
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
Product Information: (800) 582-3835
SDS Requests: (800) 414-6737

SPECIAL NOTES: This MSDS applies to: all motor gasoline.

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Flammable liquid: Category 1. Aspiration toxicant: Category 1. Carcinogen: Category 1A. Target organ toxicant (repeated exposure): Category 1. Eye irritation: Category 2A. Germ Cell Mutagen: Category 1B. Skin irritation: Category 2. Reproductive toxicant (developmental): Category 2. Target organ toxicant (central nervous system): Category 3. Acute aquatic toxicant: Category 2. Chronic aquatic toxicant: Category 2.

Signal Word: Danger

Physical Hazards: Extremely flammable liquid and vapor.

Health Hazards: May be fatal if swallowed and enters airways. May cause genetic defects. May cause cancer. Causes skin irritation. Causes serious eye irritation. Suspected of damaging the unborn child. May cause drowsiness or dizziness.

Target Organs: Causes damage to organs (Blood/Blood Forming Organs) through prolonged or repeated exposure.

Environmental Hazards: Toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS:

General: Keep out of reach of children. Read label before use.

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. -- No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use explosion-proof electrical/ventilating/lighting/equipment. Do not breathe dust/fume/gas/mist/vapours/spray. Avoid breathing dust/fume/gas/mist/vapours/spray. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Use personal protective equipment as required. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment.

Response: IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. IF ON SKIN (or hair): Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower. IF SWALLOWED: Immediately call a poison center or doctor/physician. Do NOT induce vomiting. Call a poison center or doctor/physician if you feel unwell. Get medical advice/attention if you feel unwell. IF exposed or concerned: Get medical advice/attention. In case of fire: Use media specified in the SDS to extinguish. Specific treatment (see Notes to Physician on this label). Collect spillage.

Storage: Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.

Disposal: Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

HAZARDS NOT OTHERWISE CLASSIFIED: Not Applicable

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Gasoline	86290-81-5	100 %vol/vol
Toluene (methylbenzene)	108-88-3	1 - 35 %vol/vol
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	1330-20-7	1 - 15 %vol/vol
Pentane, 2,2,4-trimethyl- (Isooctane)	540-84-1	1 - 13 %vol/vol
Butane	106-97-8	1 - 12 %vol/vol
Ethanol	64-17-5	0 - 10 %vol/vol
Benzene	71-43-2	0.1 - 4.9 %vol/vol
Hexane	110-54-3	1 - 5 %vol/vol
Heptane	142-82-5	1 - 4 %vol/vol
Ethyl benzene	100-41-4	0.1 - 3 %vol/vol
Cyclohexane	110-82-7	1 - 3 %vol/vol
Naphthalene	91-20-3	0.1 - 2 %vol/vol
Methylcyclohexane	108-87-2	1 - 2 %vol/vol

Motor gasoline is considered a mixture by EPA under the Toxic Substances Control Act (TSCA). The refinery streams used to blend motor gasoline are all on the TSCA Chemical Substances Inventory. The appropriate CAS number for refinery blended motor gasoline is 86290-81-5. The product specifications of motor gasoline sold in your area will depend on applicable Federal and State regulations.

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye: Flush eyes with water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get immediate medical attention.

Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.

Most important symptoms and effects, both acute and delayed

IMMEDIATE HEALTH EFFECTS

Eye: Contact with the eyes causes severe irritation. Symptoms may include pain, tearing, reddening, swelling and impaired vision.

Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin. Contact with the skin is not expected to cause an allergic skin response. Symptoms may include pain, itching, discoloration, swelling, and blistering.

Ingestion: Highly toxic; may be fatal if swallowed. Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.

Inhalation: Excessive or prolonged breathing of this material may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:

Reproduction and Birth Defects: Contains material that may cause harm to the unborn child if inhaled above the recommended exposure limit.

Cancer: Prolonged or repeated exposure to this material may cause cancer. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Genetic Toxicity: Contains material that may cause heritable genetic damage based on animal data.

Target Organs: Contains material that may cause damage to the following organ(s) following repeated inhalation at concentrations above the recommended exposure limit:Blood/Blood Forming Organs Risk depends on duration and level of exposure. See Section 11 for additional information.

Indication of any immediate medical attention and special treatment needed

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.
Unusual Fire Hazards: See Section 7 for proper handling and storage.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Never siphon gasoline by mouth.
Do not store in open or unlabeled containers. READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL. Do not get in eyes, on skin, or on clothing. Do not get in eyes. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank

cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: Wear protective equipment to prevent eye contact. Selection of protective equipment may include safety glasses, chemical goggles, face shields, or a combination depending on the work operations conducted.
Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted.
Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.
Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors.
When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Gasoline	ACGIH	300 ppm (weight)	500 ppm (weight)	--	A3
Toluene (methylbenzene)	ACGIH	20 ppm (weight)	--	--	--
Toluene (methylbenzene)	OSHA Z-2	200 ppm (weight)	--	300 ppm (weight)	--
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	ACGIH	100 ppm (weight)	150 ppm (weight)	--	--
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	OSHA Z-1	435 mg/m3	--	--	--
Pentane, 2,2,4-trimethyl- (Isooctane)	OSHA Z-1	2350 mg/m3	--	--	--
Pentane, 2,2,4-trimethyl- (Isooctane)	ACGIH	300 ppm (weight)	--	--	--
Butane	ACGIH	--	1000 ppm (weight)	--	--
Ethanol	ACGIH	1000 ppm (weight)	--	--	A4 A3
Ethanol	OSHA Z-1	1900 mg/m3	--	--	--
Benzene	ACGIH	.5 ppm (weight)	2.5 ppm (weight)	--	Skin A1 Skin
Benzene	OSHA SRS	1 ppm (weight)	5 ppm (weight)	--	--
Benzene	OSHA Z-2	10 ppm (weight)	--	25 ppm (weight)	--
Benzene	CVX	1 ppm (weight)	5 ppm (weight)	--	--
Hexane	ACGIH	50 ppm (weight)	--	--	Skin
Hexane	OSHA Z-1	1800 mg/m3	--	--	--
Heptane	ACGIH	400 ppm (weight)	500 ppm (weight)	--	--
Heptane	OSHA Z-1	2000 mg/m3	--	--	--
Ethyl benzene	ACGIH	20 ppm (weight)	125 ppm (weight)	--	A3
Ethyl benzene	OSHA Z-1	435 mg/m3	--	--	--
Cyclohexane	ACGIH	100 ppm (weight)	--	--	--
Cyclohexane	OSHA Z-1	1050 mg/m3	--	--	--

Naphthalene	ACGIH	10 ppm (weight)	15 ppm	--	Skin A3
Naphthalene	OSHA Z-1	50 mg/m3	--	--	--
Methylcyclohexane	ACGIH	400 ppm (weight)	--	--	--
Methylcyclohexane	OSHA Z-1	2000 mg/m3	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless to yellow
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: 5 psi - 15 psi (Typical) @ 37.8 °C (100 °F)
Vapor Density (Air = 1): 3 - 4 (Typical)
Initial Boiling Point: 27.2°C (81°F) - 204.4°C (400°F) (Typical)
Solubility: Insoluble in water; miscible with most organic solvents.
Freezing Point: Not Applicable
Melting Point: Not Applicable
Specific Gravity: 0.70 g/ml - 0.80 g/ml @ 15.6°C (60.1°F) (Typical)
Viscosity: <1 SUS @ 37.8°C (100°F)
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: 2 - 7

FLAMMABLE PROPERTIES:
Flammability (solid, gas): No Data Available

Flashpoint: (Tagliabue Closed Cup ASTM D56) < -45 °C (< -49 °F)
Autoignition: > 280 °C (> 536 °F)
Flammability (Explosive) Limits (% by volume in air): Lower: 1.4 Upper: 7.6

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for product components.

Skin Corrosion/Irritation: For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 4.8/8.0.

Skin Sensitization: This material did not cause skin sensitization reactions in a Buehler guinea pig test.

Acute Dermal Toxicity: LD50: >3.75 g/kg (rabbit).

Acute Oral Toxicity: LD50: >5 ml/kg (rat).

Acute Inhalation Toxicity: 4 hour(s) LD50: >20000 mg/m3 (rat).
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.

Carcinogenicity: The hazard evaluation is based on data for components or a similar material. Gasoline has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Whole gasoline exhaust has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC). Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains naphthalene.

GENERAL TOXICITY: Exposure to naphthalene has been reported to cause methemoglobinemia and/or hemolytic anemia, especially in humans deficient in the enzyme glucose-6-phosphate dehydrogenase. Laboratory animals given repeated oral doses of naphthalene have developed cataracts.
REPRODUCTIVE TOXICITY AND BIRTH DEFECTS: Naphthalene did not cause birth defects when administered orally to rabbits, rats, and mice during pregnancy, but slightly reduced litter size in mice at dose levels that were lethal to the pregnant females. Naphthalene has been reported to cross the human placenta. GENETIC TOXICITY: Naphthalene caused chromosome aberrations and sister chromatid exchanges in Chinese hamster ovary cells, but was not a mutagen in several other in-vitro tests.CARCINOGENICITY: In a study conducted by the National Toxicology Program (NTP), mice exposed to 10 or 30 ppm of naphthalene by inhalation daily for two years had chronic inflammation of the nose and lungs and increased incidences of metaplasia in those tissues. The incidence of benign lung tumors (alveolar/bronchiolar adenomas) was significantly increased in the high-dose female group but not in the male groups. In another two-year inhalation study conducted by NTP, exposure of rats to 10, 30, and 60 ppm naphthalene caused increases in the incidences of a variety of nonneoplastic lesions in the nose. Increases in nasal tumors were seen in both sexes, including olfactory neuroblastomas in females at 60 ppm and adenomas of the respiratory epithelium in males at all exposure levels. The relevance of these effects to humans has not been established. No carcinogenic effect was reported in a 2-year feeding study in rats receiving naphthalene at 41 mg/kg/day.

This product contains cyclohexane.
Cyclohexane primarily affects the central nervous systems of laboratory animals and humans. Acute or prolonged inhalation of cyclohexane at levels below the recommended exposure limits does not result in toxic effects while acute exposures to levels above these recommended limits can cause reversible central nervous system depression. Prolonged exposures of laboratory animals to high levels (up to low thousands of parts per million) have also caused reversible effects which included hyperactivity, diminished response to stimuli, and adaptive liver changes while very high levels (high thousands of parts per million) were fatal. No developmental effects were seen in rats or rabbits following exposures of up to 7000 ppm cyclohexane. No reproductive effects occurred in rats, although postnatal pup growth was reduced at 7000 ppm in a similar manner as observed in the parental animals. Cyclohexane has not been shown to be mutagenic in several in vitro and in vivo assays and has not produced tumors in several dermal application long-term bioassays. Based on these results and the lack of any mutagenic or genotoxic metabolites, cyclohexane is not expected to be mutagenic or genotoxic. Following dermal exposure, cyclohexane is rapidly absorbed, metabolized,and excreted.

This product contains butane.
An atmospheric concentration of 100,000 ppm (10%) butane is not noticeably irritating to the eyes, nose or respiratory tract, but will produce slight dizziness in a few minutes of exposure. No chronic systemic effect has been reported from occupational exposure.

This product contains benzene.
GENETIC TOXICITY/CANCER: Repeated or prolonged breathing of benzene vapor has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. In some individuals, benzene exposure can sensitize cardiac tissue to epinephrine which may precipitate fatal ventricular fibrillation.

REPRODUCTIVE/DEVELOPMENTAL TOXICITY: No birth defects have been shown to occur in pregnant laboratory animals exposed to doses not toxic to the mother. However, some evidence of fetal toxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta.
OCCUPATIONAL: The OSHA Benzene Standard (29 CFR 1910.1028) contains detailed requirements for training, exposure monitoring, respiratory protection and medical surveillance triggered by the exposure level. Refer to the OSHA Standard before using this product.

This product contains n-hexane.
TARGET ORGAN TOXICITY: Prolonged or repeated ingestion, skin contact or breathing of vapors of n-hexane has been shown to cause peripheral neuropathy. Recovery ranges from no recovery to complete recovery depending upon the severity of the nerve damage. Exposure to 1000 ppm n-hexane for 18 hr/day for 61 days has been shown to cause testicular damage in rats. However, when rats were exposed to higher concentrations for shorter daily periods (10,000 ppm for 6 h/day, 5 days/wk for 13 weeks), no testicular lesions were seen.
CARCINOGENICITY: Chronic exposure to commercial hexane (52% n-hexane) at a concentration of 9000ppm was not carcinogenic to rats or to male mice, but did result in an increased incidence of liver tumors in female mice. No carcinogenic effects were observed in female mice exposed to 900 or 3000 ppm hexane or in male mice. The relevance for humans of these hexane-induced mouse liver tumors is questionable.
GENETIC TOXICITY: n-Hexane caused chromosome aberrations in bone marrow of rats, but was negative in the AMES and mouse lymphoma tests.

This product contains ethanol (ethyl alcohol).
Chronic ingestion of ethanol can damage the liver, nervous system and heart. Chronic heavy consumption of alcoholic beverages has been associated with an increased risk of cancer. Ingestion of ethanol during pregnancy can cause human birth defects such as fetal alcohol syndrome. Gasolines are highly volatile and can produce significant concentrations of vapor at ambient temperatures. Gasoline vapor is heavier than air and at high concentrations may accumulate in confined spaces to present both safety and health hazards. When vapor exposures are low, or short duration and infrequent, such as during refueling and tanker loading/unloading, neither total hydrocarbon nor components such as benzene are likely to result in any adverse health effects. In situations such as accidents or spills where exposure to gasoline vapor is potentially high, attention should be paid to potential toxic effects of specific components. Information about specific components in gasoline can be found in Sections 2/3, 8 and 15 of this MSDS. More detailed information on the health hazards of specific gasoline components can be obtained calling the Chevron Emergency Information Center (see Section 1 for phone numbers).
Pathological misuse of solvents and gasoline, involving repeated and prolonged exposure to high concentrations of vapor is a significant exposure on which there are many reports in the medical literature. As with other solvents, persistent abuse involving repeated and prolonged exposures to high concentrations of vapor has been reported to result in central nervous system damage and eventually, death. In a study in which ten human volunteers were exposed for 30 minutes to approximately 200, 500 or 1000 ppm concentrations of gasoline vapor, irritation of the eyes was the only significant effect observed, based on both subjective and objective assessments.
Lifetime inhalation of wholly vaporized unleaded gasoline at 2056 ppm has caused increased liver tumors

in female mice and kidney cancer in male rats. In their 1988 review of carcinogenic risk from gasoline, The International Agency for Research on Cancer (IARC) noted that, because published epidemiology studies did not include any exposure data, only occupations where gasoline exposure may have occurred were reviewed. These included gasoline service station attendants and automobile mechanics. IARC also noted that there was no opportunity to separate effects of combustion products from those of gasoline itself. Although IARC allocated gasoline a final overall classification of Group 2B, i.e. possibly carcinogenic to humans, this was based on limited evidence in experimental animals plus supporting evidence including the presence in gasoline of benzene. The actual evidence for carcinogenicity in humans was considered inadequate.

MUTAGENICITY: Gasoline was not mutagenic, with or without activation, in the Ames assay (Salmonella typhimurium), Saccharamyces cerevisesae, or mouse lymphoma assays. In addition, point mutations were not induced in human lymphocytes. Gasoline was not mutagenic when tested in the mouse dominant lethal assay. Administration of gasoline to rats did not cause chomosomal aberrations in their bone marrow cells.

EPIDEMIOLOGY: To explore the health effects of workers potentially exposed to gasoline vapors in the marketing and distribution sectors of the petroleum industry, the American Petroleum Institute sponsored a cohort mortality study (Publication 4555), a nested case-control study (Publication 4551), and an exposure assessment study (Publication 4552). Histories of exposure to gasoline were reconstructed for cohort of more than 18,000 employees from four companies for the time period between 1946 and 1985. The results of the cohort mortality study indicated that there was no increased mortality from either kidney cancer or leukemia among marketing and marine distribution employees who were exposed to gasoline in the petroleum industry, when compared to the general population. More importantly, based on internal comparisons, there was no association between mortality from kidney cancer or leukemia and various indices of gasoline exposure. In particular, neither duration of employment, duration of exposure, age at first exposure, year of first exposure, job category, cumulative exposure, frequency of peak exposure, nor average intensity of exposure had any effect on kidney cancer or leukemia mortality. The results of the nested case-control study confirmed the findings of the original cohort study. That is, exposure to gasoline at the levels experienced by this cohort of distribution workers is not a significant risk factor for leukemia (all cell types), acute myeloid leukemia, kidney cancer or multiple myeloma.

This product contains ethylbenzene.

BIRTH DEFECTS AND REPRODUCTION: Ethylbenzene is not expected to cause birth defects or other developmental effects based on well-conducted studies in rabbits and rats sponsored by NIOSH. Other studies in rats and mice which reported urinary tract malformations have many deficiencies and have limited usefulness in evaluating human risk. Reproductive effects are not expected based on a NIOSH study of fertility, and lack of effects observed for sperm counts and motility, estrous cycle and pathology of reproductive organs following repeated exposures. HEARING: Statistically significant losses in outer hair cells (OHCs) were observed in rats exposed to >=200 ppm ethylbenzene, 6 hours/day, 6 days/week for 13 weeks, after an 8-week recovery period. Following longer exposure, inner hair cells losses were also observed in rats exposed to >= 600 ppm ethylbenzene, but only occasionally in rats exposed to 400 ppm. The Lowest Observed Adverse Effect Level in rats (LOAEL) was 200 ppm for losses of OHCs. Guinea pigs exposed to ethylbenzene at 2,500 ppm, 6 hours/day for 5 days did not show auditory deficits or losses in OHCs. The concentration of ethylbenzene used in the JP-8 study was approximately 10 ppm. GENETIC TOXICITY: Ethylbenzene tested negative in the bacterial mutation test, Chinese Hamster Ovary (CHO) cell in vitro assay, sister chromatid exchange assay and an unscheduled DNA synthesis assay. Conflicting results have been reported for the mouse lymphoma cell assay. Increased micronuclei were reported in an

in vitro Syrian hamster embryo cell assay; however, two in vivo micronuclei studies in mice were negative. In Syrian hamster embryo cells in vitro, cell transformation was observed at 7 days of incubation but not at 24 hours. Based on these results, ethylbenzene is not expected to be mutagenic or clastogenic.
CARCINOGENICITY: In studies conducted by the National Toxicology Program, rats and mice were exposed to ethylbenzene at 25, 250 and 750 ppm for six hours per day, five days per week for 103 weeks. In rats exposed to 750 ppm, the incidence of kidney tubule hyperplasia and tumors was increased. Testicular tumors develop spontaneously in nearly all rats if allowed to complete their natural life span; in this study, the development of these tumors appeared to be enhanced in male rats exposed to 750 ppm. In mice, the incidences of lung tumors in males and liver tumors in females exposed to 750 ppm were increased as compared to control mice but were within the range of incidences observed historically in control mice. Other liver effects were observed in male mice exposed to 250 and 750 ppm. The incidences of hyperplasia were increased in the pituitary gland in female mice at 250 and 750 ppm and in the thyroid in male and female mice at 750 ppm.

This product contains toluene.
GENERAL TOXICITY: The primary effects of exposure to toluene in animals and humans are on the central nervous system. Solvent abusers, who typically inhale high concentrations (thousands of ppm) for brief periods of time, in addition to experiencing respiratory tract irritation, often suffer permanent central nervous system effects that include tremors, staggered gait, impaired speech, hearing and vision loss, and changes in brain tissue. Death in some solvent abusers has been attributed to cardiac arrhythmias, which appear to be have been triggered by epinephrine acting on solvent sensitized cardiac tissue. Although liver and kidney effects have been seen in some solvent abusers, results of animal testing with toluene do not support these as primary target organs.
HEARING: Humans who were occupationally exposed to concentrations of toluene as low as 100 ppm for long periods of time have experienced hearing deficits. Hearing loss, as demonstrated using behavioral and electrophysiological testing as well as by observation of structural damage to cochlear hair cells, occurred in experimental animals exposed to toluene. It also appears that toluene exposure and noise may interact to produce hearing deficits.
COLOR VISION: In a single study of workers exposed to toluene at levels under 50 ppm, small decreases in the ability to discriminate colors in the blue-yellow range have been reported for female workers. This effect, which should be investigated further, is very subtle and would not likely have been noticed by the people tested.
REPRODUCTIVE/DEVELOPMENTAL TOXICITY: Toluene may also cause mental and/or growth retardation in the children of female solvent abusers who directly inhale toluene (usually at thousands of ppm) when they are pregnant. Toluene caused growth retardation in rats and rabbits when administered at doses that were toxic to the mothers. In rats, concentrations of up to 5000 ppm did not cause birth defects. No effects were observed in the offspring at doses that did not intoxicate the pregnant animals. The exposure level at which no effects were seen (No Observed Effect Level, NOEL) is 750 ppm in the rat and 500 ppm in the rabbit.

This product contains xylene.
ACUTE TOXICITY: The primary effects of exposure to xylene in animals and humans are on the central nervous system. In addition,in some individuals, xylene exposure can sensitize cardiac tissue to epinephrine which may precipitate fatal ventricular fibrillation. DEVELOPMENTAL TOXICITY: Xylene has been reported to cause developmental toxicity in rats and mice exposed by inhalation during pregnancy.

The effects noted consisted of delayed development and minor skeletal variations. In addition, when pregnant mice were exposed by ingestion to a level that killed nearly one-third of the test group, lethality (resorptions) and malformations (primarily cleft palate) occurred. Since xylene can cross the placenta, it may be appropriate to prevent exposure during pregnancy. GENETIC TOXICITY/CARCINOGENICITY: Xylene was not genotoxic in several mutagenicity testing assays including the Ames test. In a cancer study sponsored by the National Toxicology Program (NTP),technical grade xylene gave no evidence of carcinogenicity in rats or mice dosed daily for two years. HEARING: Mixed xylenes have been shown to cause measurable hearing loss in rats exposed to 800 ppm in the air for 14 hours per day for six weeks. Exposure to 1450 ppm xylene for 8 hours caused hearing loss while exposure to 1700 ppm for 4 hours did not. Although no information is available for lower concentrations, other chemicals that cause hearing loss in rats at relatively high concentrations do not cause hearing loss in rats at low concentrations. Worker exposure to xylenes at the permissible exposure limit (100 ppm, time-weighted average) is not expected to cause hearing loss.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

48 hour(s) LC50: 3.0 mg/l (Daphnia magna)
96 hour(s) LC50: 1.8 mg/l (Mysidopsis bahia)
96 hour(s) LC50: 8.3 mg/l (Cyprinodon variegatus)
96 hour(s) LC50: 2.7 mg/l (Oncorhynchus mykiss)

MOBILITY

No data available.

PERSISTENCE AND DEGRADABILITY

This material is expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the weathering of spilled gasoline.

The aqueous solubility of non-oxygenated unleaded gasoline, based on analysis of benzene, toluene, ethylbenzene+xylenes and naphthalene, is reported to be 112 mg/l. Solubility data on individual gasoline constituents also available.

POTENTIAL TO BIOACCUMULATE

Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: 2 - 7

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations. Check governmental regulations and local authorities for approved disposal of this material.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: UN1203, GASOLINE, 3, II; OPTIONAL DISCLOSURE: UN1203, GASOLINE, 3, II, MARINE POLLUTANT (GASOLINE)

IMO/IMDG Shipping Description: UN1203, GASOLINE, 3, II, FLASH POINT SEE SECTION 5 OR 9, MARINE POLLUTANT (GASOLINE)

ICAO/IATA Shipping Description: UN1203, GASOLINE, 3, II

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:
Not applicable

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1.	Immediate (Acute) Health Effects:	YES
2.	Delayed (Chronic) Health Effects:	YES
3.	Fire Hazard:	YES
4.	Sudden Release of Pressure Hazard:	NO
5.	Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	03, 05, 06, 07
Cyclohexane	05, 06, 07
Naphthalene	01-2B, 02, 04, 05, 06, 07
Pentane, 2,2,4-trimethyl- (Isooctane)	05, 06, 07
Ethyl benzene	01-2B, 03, 04, 05, 06, 07
Methylcyclohexane	05, 06, 07
Benzene	01-1, 02, 03, 04, 05, 06, 07
Ethanol	01-1, 02, 04, 05, 06, 07
Toluene (methylbenzene)	04, 05, 06, 07
Butane	05, 06, 07
Hexane	05, 06, 07
Gasoline	01-2B, 07
Heptane	05, 06, 07

CERCLA REPORTABLE QUANTITIES(RQ)/EPCRA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ
Benzene	10 lbs	None	186 lbs
Cyclohexane	1000 lbs	None	34188 lbs
Ethyl benzene	1000 lbs	None	34964 lbs
Hexane	5000 lbs	None	129149 lbs
Naphthalene	100 lbs	None	4000 lbs
Pentane, 2,2,4-trimethyl- (Isooctane)	1000 lbs	None	6270 lbs
Toluene (methylbenzene)	1000 lbs	None	2627 lbs
Xylene (contains o-, m-, & p- xylene isomers in varying amounts)	100 lbs	None	649 lbs

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 4 Reactivity: 0

HMIS RATINGS: Health: 2* Flammability: 4 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

Additional Product Number(s): 201023, 201054, 201055, 201075, 201090, 201105, 201106, 201120, 201121, 201122, 201126, 201128, 201131, 201136, 201141, 201142, 201148, 201153, 201158, 201161, 201162, 201168, 201175, 201181, 201185, 201186, 201188, 201216, 201217, 201218, 201236, 201237, 201238, 201266, 201267, 201268, 201277, 201278, 201279, 201286, 201287, 201289, 201296, 201297, 201298, 201849, 201850, 201855, 201856, 201857, 204000, 204001, 204002, 204003, 204010, 204011, 204022, 204023, 204046, 204047, 204070, 204071, 204088, 204089, 204104, 204105, 204116, 204117, 204140, 204141, 204164, 204165, 204188, 204189, 204200, 204201, 204207, 204212, 204213, 204224, 204225, 204248, 204249, 204272, 204273, 204290, 204291, 204322, 204323, 204324, 204350, 204352, 204354, 204356, 204358, 204359, 204364, 204365, 204370, 204371, 204376, 204377, 204382, 204383, 204388, 204389, 204394, 204395, 204400, 204401, 204406, 204407, 204412, 204413, 204418, 204419, 204424, 204425, 204430, 204431, 204436, 204437, 204442, 204446, 204450, 204454, 204458, 204462, 204466, 204467, 204484, 204485, 204502, 204503, 204520, 204521, 204538, 204539, 204556, 204557, 204574, 204575, 204592, 204593, 204610, 204611, 204628, 204629, 204646, 204647, 204664, 204665, 204682, 204690, 204691, 204696, 204697, 204702, 204703, 204708, 204709, 204721, 204722, 204727, 204728, 204739, 241765

REVISION STATEMENT: This revision updates the following sections of this Safety Data Sheet: 1,16

Revision Date: MARCH 10, 2016

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
HMIS - Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to the 29 CFR 1910.1200 (2012) by Chevron Energy Technology Company, 6001 Bollinger Canyon Road San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with

which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

ExxonMobil

642801-60 GLYGOYLE GREASE 00
MATERIAL SAFETY DATA BULLETIN

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: GLYGOYLE GREASE 00
SUPPLIER: EXXONMOBIL OIL CORPORATION
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Health and Safety Emergency (call collect): 609-737-4411

24 - Hour Transportation Emergency:
CHEMTREC: 800-424-9300 202-483-7616
LUBES AND FUELS: 281-834-3296

Product and Technical Information:
Lubricants and Specialties: 800-662-4525 800-443-9966
Fuels Products: 800-947-9147
MSDS Fax on Demand: 713-613-3661
MSDS on Internet: http://www.exxon.com
http://www.mobil.com

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2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: POLYGLYCOLS

GLOBALLY REPORTABLE MSDS INGREDIENTS:

Substance Name	Approx. Wt%
1-NAPHTHYLAMINE, N-PHENYL (90-30-2)	1-5

See Section 8 for exposure limits (if applicable).

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3. HAZARDS IDENTIFICATION

Under normal conditions of use, this product is not considered hazardous according to regulatory guidelines (See section 15).

EMERGENCY OVERVIEW: Pale Yellow Grease. DOT ERG No. : NA

POTENTIAL HEALTH EFFECTS: Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation.

POTENTIAL ENVIRONMENTAL EFFECTS: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

For further health effects/toxicological data, see Section 11.

---

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.

SKIN CONTACT: Wash contact areas with soap and water. Remove and clean oil soaked clothing daily and wash affected area. INJECTION INJURY WARNING: If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth-to-mouth resuscitation.

INGESTION: Not expected to be a problem. Seek medical attention if discomfort occurs. Do not induce vomiting.

---

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.

SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.

SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

COMBUSTION PRODUCTS: Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

Flash Point C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC)).

Flammable Limits (approx.% vol.in air) - LEL: NE, UEL: NE

NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0

---

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills/releases as required to appropriate authorities. U.S. Coast Guard and EPA regulations require immediate reporting of spills/releases that could reach any waterway including intermittent dry creeks. Report spill/release to

Coast Guard National Response Center toll free number (800)424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.

PROCEDURES IF MATERIAL IS RELEASED OR SPILLED:
LAND SPILL: Shut off source taking normal safety precautions. Take measures to minimize the effects on ground water. Recover by pumping or contain spilled material with sand or other suitable absorbent and remove mechanically into containers. If necessary, dispose of adsorbed residues as directed in Section 13.
WATER SPILL: Confine the spill immediately with booms. Warn other ships in the vicinity. Notify port and other relevant authorities. Remove from the surface by skimming or with suitable absorbents. If permitted by regulatory authorities the use of suitable dispersants should be considered where recommended in local oil spill procedures.

ENVIRONMENTAL PRECAUTIONS: Prevent material from entering sewers, water sources or low lying areas; advise the relevant authorities if it has, or if it contaminates soil/vegetation.

PERSONAL PRECAUTIONS: See Section 8

---

7. HANDLING AND STORAGE

HANDLING: High pressure injection under the skin may occur due to the rupture of pressurized lines. Always seek medical attention. No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.

STORAGE: Keep containers closed when not in use. Do not store in open or unlabelled containers. Store away from strong oxidizing agents and combustible materials. Do not store near heat, sparks, flame or strong oxidants.

SPECIAL PRECAUTIONS: Prevent small spills and leakages to avoid slip hazard.

EMPTY CONTAINER WARNING: Empty containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS:

This product does not contain any components which have recognized exposure limits.

VENTILATION: Use adequate ventilation.

RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.

EYE PROTECTION: Generally eye contact is unlikely with this type material. If eye contact is likely, safety glasses with side

shields or chemical type goggles should be worn.
SKIN PROTECTION: If prolonged or repeated skin contact is likely, oil impervious gloves should be worn. Good personal hygiene practices should always be followed.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Grease
COLOR: Pale Yellow
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): NE
DROP POINT C(F): NE
FLASH POINT C(F): > 204(400) (ESTIMATED FOR OIL, ASTM D-92 (COC))
FLAMMABILITY (solids): NE
AUTO FLAMMABILITY C(F): NA
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: < 0.1
VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 1
SOLUBILITY IN WATER: Negligible
PARTITION COEFFICIENT: > 3.5
VISCOSITY AT 40 C, cSt: > 120.0
VISCOSITY AT 100 C, cSt: NE
POUR POINT C(F): NA
FREEZING POINT C(F): NE
VOLATILE ORGANIC COMPOUND: NE
NOTE: MOST PHYSICAL PROPERTIES FOR OIL COMPONENT.
DMSO EXTRACT, IP-346 (WT.%): <3, for mineral oil only
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

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10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat and high energy sources of ignition.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Product does not decompose at ambient temperatures.
HAZARDOUS POLYMERIZATION: Will not occur.

---

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

INHALATION TOXICITY (RATS): Practically non-toxic (LC50: greater than 5 mg/l). ---Based on testing of similar products and/or the components.

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

OTHER ACUTE TOXICITY DATA: Although an acute inhalation study was not performed with this product, a variety of mineral oils and synthetic base oils, such as those in this product have been tested. These samples had virtually no effect other than a nonspecific inflammatory response in the lung to the aerosolized mineral oil. The presence of additives in other tested formulations (in approximately the same amounts as in the present formulation) did not alter the observed effects.

---SUBCHRONIC TOXICOLOGY (SUMMARY)---

No significant adverse effects were found in studies using repeated dermal applications of similar formulations to the skin of laboratory animals for 13 weeks at doses significantly higher than those expected during normal industrial exposure. The animals were evaluated extensively for effects of exposure (hematology, serum chemistry, urinalysis, organ weights, microscopic examination of tissues etc.).

---REPRODUCTIVE TOXICOLOGY (SUMMARY)---

No teratogenic effects would be expected from dermal exposure, based on laboratory developmental toxicity studies of major components in this formulation and/or materials of similar composition.

---CHRONIC TOXICOLOGY (SUMMARY)---

Repeated and/or prolonged exposure may cause irritation to the skin, eyes or respiratory tract. For mineral base oils: Base oils in this product are severely solvent refined and/or severely hydrotreated. Chronic mouse skin painting studies of severely treated oils showed no evidence of carcinogenic effects. These results are confirmed on a continuing basis using various screening methods such as Modified Ames Test, IP-346, and/or other analytical methods. For synthetic base oils: The base oils in this product have been tested in the Ames assay and other tests of mutagenicity with negative results. These base oils are not expected to be carcinogenic with chronic dermal exposures.

---SENSITIZATION (SUMMARY)---

Not expected to be sensitizing based on tests of this product, components, or similar products.

---

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS:

This environmental assessment was conducted using information on the individual components as no test data was available for this specific formulation.

ECOTOXICITY: This product is expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY: Not established.

PERSISTENCE AND DEGRADABILITY: This product is expected to be inherently biodegradable, as the principal components have been shown to degrade at slow to moderate rates.

BIOACCUMULATIVE POTENTIAL: Not established.

---

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity. The unused product is not formulated with substances covered by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

---

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

RID/ADR: NOT REGULATED BY RID/ADR.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

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15. REGULATORY INFORMATION

US OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purposes, this product is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200.

EU Labeling: Product is dangerous as defined by the European Union Dangerous Substances/Preparations Directives.

Symbol: Not applicable.

Risk Phrase(s): R52/53.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrase(s): S61.
Avoid release to the environment. Refer to special instructions/Safety data sheets.

Governmental Inventory Status: All components comply with TSCA, and EINECS/ELINCS.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains no chemicals subject to the supplier notification requirements of SARA (313) toxic release program.

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS *
LITHIUM-SOAP THICKENER (2.69%)	7620-77-1	22

--- REGULATORY LISTS SEARCHED ---

1=ACGIH ALL	6=IARC 1	11=TSCA 4	16=CA P65 CARC	21=LA RTK
2=ACGIH A1	7=IARC 2A	12=TSCA 5a2	17=CA P65 REPRO	22=MI 293
3=ACGIH A2	8=IARC 2B	13=TSCA 5e	18=CA RTK	23=MN RTK
4=NTP CARC	9=OSHA CARC	14=TSCA 6	19=FL RTK	24=NJ RTK
5=NTP SUS	10=OSHA Z	15=TSCA 12b	20=IL RTK	25=PA RTK
				26=RI RTK

* EPA recently added new chemical substances to its TSCA Section 4 test rules. Please contact the supplier to confirm whether the ingredients in this product currently appear on a TSCA 4 or TSCA 12b list.
Code key:CARC=Carcinogen; SUS=Suspected Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

USE: GREASE

NOTE: PRODUCTS OF EXXON MOBIL CORPORATION AND ITS AFFILIATED COMPANIES

ARE NOT FORMULATED TO CONTAIN PCBS.

Health studies have shown that many hydrocarbons pose potential human health risks which may vary from person to person. Information provided on this MSDS reflects intended use. This product should not be used for other applications. In any case, the following advice should be considered:

INDUSTRIAL LABEL

Under normal conditions of intended use, this product does not pose a risk to health. Excessive exposure may result in eye, skin or respiratory irritation. Always observe good hygiene measures. First Aid: Wash skin with soap and water. Flush eyes with water. If overcome by fumes or vapor, remove to fresh air. If ingested do not induce vomiting. If symptoms persist seek medical assistance. Read and understand the MSDS before using this product.

****
For Internal Use Only: MHC: 1* 1* 1* 1* 1*, MPPEC: A, TRN: 642801-60, ELIS: 400025, CMCS97: 970446, REQ: FRANCE, SAFE USE: L
EHS Approval Date: 20OCT2003
****

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, republication or retransmission of this document, in whole or in part, is not permitted. Exxon Mobil Corporation and its affiliated companies assume no responsibility for accuracy of information unless the document is the most current available from an official ExxonMobil distribution system. Exxon Mobil Corporation and its affiliated companies neither represent nor warrant that the format, content or product formulas contained in this document comply with the laws of any other country except the United States of America.

Prepared by: ExxonMobil Oil Corporation
Environmental Health and Safety Department, Clinton, USA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : HARDENER HV 5309-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Hardener

1.3 Details of the supplier of the safety data sheet

Company : Huntsman Advanced Materials (Europe)BVBA
Address : Everslaan 45
3078 Everberg
Belgium
Telephone : +41 61 299 20 41
Telefax : +41 61 299 20 40

E-mail address of person responsible for the SDS : Global Product EHS AdMat huntsman.com

1.4 Emergency telephone number

Emergency telephone number : +45 82 12 12 12
EUROPE: +32 35 75 1234
France ORFILA: +33(0)145425959
ASIA: +65 6336-6011
China: +86 20 39377888
+86 532 83889090
India: + 91 22 42 87 5333
Australia: 1800 786 152
New Zealand: 0800 767 437
USA: +1/800/424.9300

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Acute toxicity, Category 4	H332: Harmful if inhaled.
Skin corrosion, Category 1B	H314: Causes severe skin burns and eye damage.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Chronic aquatic toxicity, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements :

H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H332	Harmful if inhaled.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P261	Avoid breathing mist or vapours.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Disposal:

P501	Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous components which must be listed on the label:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated

diethylenetriamine

2-piperazin-1-ylethylamine

2,4,6-tris(dimethylaminomethyl)phenol

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.
No information available.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components

Chemical name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration (% w/w)
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated	68683-29-4	Skin Sens. 1; H317 Skin Irrit. 2; H315	13 - 30
Bis(isopropyl)naphthalene	38640-62-9 254-052-6 -	Asp. Tox. 1; H304 Aquatic Chronic 1; H410	7 - 13
2,2 -Iminodi(ethylamine)	111-40-0 203-865-4 01-2119473793-27	Acute Tox. 4; H302 Acute Tox. 2; H330 Acute Tox. 4; H312 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 STOT SE 3; H335	3 - 7
2-Piperazin-1-ylethylamine	140-31-8 205-411-0 01-2119471486-30	Acute Tox. 4; H302 Acute Tox. 3; H311 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Chronic 3; H412	1 - 3
2,4,6-Tris(dimethylaminomethyl)phenol	90-72-2 202-013-9 01-2119560597-27	Acute Tox. 4; H302 Skin Corr. 1C; H314 Eye Dam. 1; H318 Aquatic Chronic 3; H412 Skin Sens. 1B; H317	1 - 3
4,4 -Isopropylidenediphenol	80-05-7 201-245-8 01-2119457856-23	Eye Dam. 1; H318 Skin Sens. 1; H317 Repr. 2; H361f STOT SE 3; H335 Aquatic Chronic 2; H411	0,1 - 1
Amines, polyethylenepoly-, triethylenetetramine fraction	90640-67-8 01-2119487919-13	Acute Tox. 4; H302 Acute Tox. 4; H312 Skin Corr. 1B; H314 Skin Sens. 1; H317 Aquatic Chronic 3; H412	0,1 - 1

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : Consult a physician after significant exposure.
If unconscious place in recovery position and seek medical advice.

In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
If on skin, rinse well with water.
If on clothes, remove clothes.

In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

None known.

4.3 Indication of any immediate medical attention and special treatment needed

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media : High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during : Do not allow run-off from fire fighting to enter drains or water

firefighting		courses.
Hazardous combustion products	:	No data is available on the product itself.

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Specific extinguishing methods	:	No data is available on the product itself.
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Ensure adequate ventilation.

6.2 Environmental precautions

Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

None

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling	:	Avoid formation of aerosol. Do not breathe vapours/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Provide sufficient air exchange and/or exhaust in work rooms. To avoid spills during handling keep bottle on a metal tray.

Dispose of rinse water in accordance with local and national regulations.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

Recommended storage temperature : 2 - 40 °C

Other data : No decomposition if stored and applied as directed.

7.3 Specific end use(s)

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
diethylenetriamine	111-40-0	GV	1 ppm 4 mg/m3	DK OEL
Further information	Means that the substance can be absorbed through the skin., Guiding list of organic solvents.			
bisphenol A	80-05-7	GV (inhalable dust)	3 mg/m3	DK OEL
Further information	List of limit values for dust. Limit values for dust have been established for concentrations of total dust and for concentrations of respirable dust. Except for wood dust, Arbejdstilsynet has not established a limit value for inhalable dust (DS/EN 481 on inhalable dust)., The substance has an EC-limit value			
		TWA (inhalable dust)	10 mg/m3	2009/161/EU
Further information	Indicative			

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
diethylenetriamine	Workers	Inhalation	Systemic effects,	92,1 mg/m3

			Short-term exposure	
	Workers	Inhalation	Local effects, Short-term exposure	2,6 mg/m3
	Workers	Dermal	Systemic effects, Long-term exposure	11,4 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Long-term exposure	15,4 mg/m3
	Workers	Dermal	Local effects, Long-term exposure	1,1 mg/cm2
	Workers	Inhalation	Local effects, Long-term exposure	0,87 mg/m3
	Consumers	Oral	Local effects, Short-term exposure	4,88 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Short-term exposure	27,5 mg/m3
	Consumers	Dermal	Systemic effects, Long-term exposure	4,88 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	4,6 mg/m3
2,4,6-tris(dimethylaminomethyl)phenol	Workers	Inhalation	Systemic effects, Long-term exposure	0,31 mg/m3
bis(isopropyl)naphthalene	Workers	Inhalation	Systemic effects, Long-term exposure	30 mg/m3
	Workers	Dermal	Systemic effects, Long-term exposure	4,3 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	7,4 mg/m3
	Consumers	Dermal	Systemic effects, Long-term exposure	2,1 mg/kg bw/day
	Consumers	Oral	Systemic effects, Long-term exposure	2,1 mg/kg bw/day
2-piperazin-1-ylethylamine	Workers	Dermal	Systemic effects, Short-term exposure	20 mg/kg bw/day
	Workers	Dermal	Local effects, Short-term exposure	0,04 mg/cm2
	Workers	Dermal	Systemic effects, Long-term exposure	3,3 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Long-term exposure	3,6 mg/m3
	Workers	Dermal	Local effects, Long-term exposure	0,006 mg/cm2
	Consumers	Dermal	Systemic effects, Long-term exposure	1,7 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Short-term exposure	5,3 mg/m3
	Consumers	Oral	Systemic effects, Long-term exposure	0,3 mg/kg bw/day

	Consumers	Dermal	Local effects, Short-term exposure	0,02 mg/cm2
	Consumers	Dermal	Systemic effects, Short-term exposure	10 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	0,9 mg/m3
	Consumers	Oral	Systemic effects, Short-term exposure	1,5 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Short-term exposure	21,4 mg/m3
	Consumers	Dermal	Local effects, Long-term exposure	0,003 mg/cm2
3,6-diazaoctanethylenediamin	Workers	Inhalation	Systemic effects, Short-term exposure	5380 mg/m3
	Workers	Dermal	Systemic effects, Long-term exposure	0,57 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Long-term exposure	1 mg/m3
	Workers	Dermal	Local effects, Long-term exposure	0,028 mg/m3
	Consumers	Dermal	Systemic effects, Short-term exposure	8 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Short-term exposure	1600 mg/m3
	Consumers	Oral	Systemic effects, Short-term exposure	20 mg/kg bw/day
	Consumers	Dermal	Local effects, Short-term exposure	1 mg/cm2
	Consumers	Dermal	Local effects, Short-term exposure	0,25 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	0,29 mg/m3
	Consumers	Oral	Systemic effects, Long-term exposure	0,41 mg/kg bw/day
	Consumers	Dermal	Local effects, Long-term exposure	0,43 mg/cm2

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
diethylenetriamine	Fresh water	0,56 mg/l
Remarks:	Assessment Factors	
	Marine water	0,056 mg/l
	Assessment Factors	
	Fresh water sediment	1072 mg/kg
	Equilibrium method	

	Marine sediment	107,2 mg/kg
	Equilibrium method	
	Soil	7,97 mg/kg
	Equilibrium method, Assessment Factors	
	Freshwater - intermittent	0,32 mg/l
	Assessment Factors	
2,4,6-tris(dimethylaminomethyl)phenol	Fresh water	0,084 mg/l
	Assessment Factors	
	Marine water	0,0084 mg/l
	Assessment Factors	
	Freshwater - intermittent	0,84 mg/l
	Assessment Factors	
	Sewage treatment plant	0,2 mg/l
	Assessment Factors	
bis(isopropyl)naphthalene	Fresh water	0,26 g/l
	Assessment Factors	
	Marine water	0,026 g/l
	Assessment Factors	
	Sewage treatment plant	0,15 mg/l
	Assessment Factors	
	Fresh water sediment	0,94 mg/kg
	Equilibrium method	
	Marine sediment	0,094 mg/kg
	Equilibrium method	
	Soil	0,1872 mg/kg
	Equilibrium method	
	Secondary Poisoning	25 mg/kg
	Assessment Factors	
2-piperazin-1-ylethylamine	Fresh water	0,058 mg/l
	Assessment Factors	
	Marine water	0,0058 mg/l
	Assessment Factors	
	Freshwater - intermittent	0,58 mg/l
	Assessment Factors	
	Fresh water sediment	215 mg/kg

	Equilibrium method	
	Marine sediment	21,5 mg/kg
	Equilibrium method	
	Soil	42,9 mg/kg
	Equilibrium method	
	Sewage treatment plant	250 mg/l
	Assessment Factors	
3,6-diazaoctanethylenediamin	Fresh water	190 g/l
	Assessment Factors	
	Fresh water sediment	95,9 mg/kg
	Equilibrium method	
	Marine water	38 g/l
	Assessment Factors	
	Freshwater - intermittent	200 g/l
	Assessment Factors	
	Marine sediment	19,2 mg/kg
	Equilibrium method	
	Soil	19,1 mg/kg
	Equilibrium method	
	Sewage treatment plant	4,25 mg/l
	Assessment Factors	
	Secondary Poisoning	0,18 mg/kg
	Assessment Factors	

8.2 Exposure controls

Personal protective equipment

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Hand protection
Material : butyl-rubber

Material : Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time : > 8 h

Material : Nitrile rubber
Break through time : 10 - 480 min

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Take note of the

information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.

No personal respiratory protective equipment normally required.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	paste
Colour	:	light cream
Odour	:	amine-like
Boiling point	:	> 200 °C
Flash point	:	> 100 °C Method: Pensky-Martens closed cup, closed cup
Vapour pressure	:	0,49 hPa (20 °C)
Density	:	1,4 g/cm3 (20 °C)
Solubility(ies)		
Water solubility	:	practically insoluble (20 °C)
Decomposition temperature	:	> 200 °C
Viscosity		
Viscosity, dynamic	:	thixotropic

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions : No decomposition if stored and applied as directed.

10.4 Conditions to avoid

Conditions to avoid : No data available

10.5 Incompatible materials

10.6 Hazardous decomposition products

Burning produces noxious and toxic fumes.
Nitrogen oxides (NOx)
Carbon oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity - Product : Acute toxicity estimate : > 2.000 mg/kg
Method: Calculation method

Acute inhalation toxicity - Product : Acute toxicity estimate : 3,12 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity - Product : Acute toxicity estimate : > 2.000 mg/kg
Method: Calculation method

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation

Components:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**
Species: Rabbit
Assessment: Moderate skin irritant
Result: Irritating to skin.

diethylenetriamine**:**
Species: Rabbit
Result: Causes burns.

2-piperazin-1-ylethylamine**:**
Species: Rabbit
Result: Causes burns.

2,4,6-tris(dimethylaminomethyl)phenol**:**
Species: Rabbit

Method: OECD Test Guideline 404
Result: Corrosive after 1 to 4 hours of exposure

bisphenol A**:**
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

trientine**:**
Species: Rabbit
Method: OECD Test Guideline 405
Result: Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation

Components:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**
Species: Rabbit
Assessment: Mild eye irritant
Result: slight irritation

diethylenetriamine**:**
Species: Rabbit
Assessment: Corrosive
Result: Corrosive

2-piperazin-1-ylethylamine**:**
Species: Rabbit
Result: Risk of serious damage to eyes.

2,4,6-tris(dimethylaminomethyl)phenol**:**
Species: Rabbit
Assessment: Corrosive
Result: Irreversible effects on the eye

bisphenol A**:**
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irreversible effects on the eye

trientine**:**
Species: Rabbit
Assessment: Corrosive
Method: OECD Test Guideline 404
Result: Corrosive

Respiratory or skin sensitisation

Components:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**
Exposure routes: Skin
Species: Guinea pig

Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

naphthalene, bis(1-methylethyl)-:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Does not cause skin sensitisation.

Diethylenetriamine:
Exposure routes: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: May cause sensitisation by skin contact.
Remarks: Causes sensitisation.

Exposure routes: Respiratory Tract
Species: Mouse
Result: Does not cause respiratory sensitisation.

Aminoethylpiperazine:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

2,4,6-tris(dimethylaminomethyl)phenol:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Assessment: The product is a skin sensitiser, sub-category 1B.
Result: The product is a skin sensitiser, sub-category 1B.

4,4 -isopropylidenediphenol:
Exposure routes: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: Does not cause skin sensitisation.

Exposure routes: Skin
Species: Humans
Assessment: May cause sensitisation by skin contact.
Result: Causes sensitisation.

trientine:
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

Assessment: No data available

Germ cell mutagenicity

Components:

bis(isopropyl)naphthalene:

Genotoxicity in vitro : Concentration: 92 mg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

: Concentration: 40 - 60 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

2-piperazin-1-ylethylamine:

Genotoxicity in vitro : Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

: Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

2,4,6-tris(dimethylaminomethyl)phenol:

Genotoxicity in vitro : Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

: Concentration: 2500 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

: Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

bisphenol A:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Result: negative

trientine:
Genotoxicity in vitro : Concentration: 0 - 200 g/L
Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

Components:

bis(isopropyl)naphthalene:
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 1.92 g/kg
Method: OECD Test Guideline 474
Result: negative

diethylenetriamine:
Genotoxicity in vivo : Cell type: Somatic
Application Route: Oral
Dose: 85 - 850 mg/kg
Method: OECD Test Guideline 474
Result: negative

Application Route: Oral
Result: negative

2-piperazin-1-ylethylamine:
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 175 - 560 mg/kg
Method: OECD Test Guideline 474
Result: negative

bisphenol A:
Genotoxicity in vivo : Method: OECD Test Guideline 474
Result: negative

trientine:
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 0 - 600 mg/kg
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity

Components:

diethylenetriamine:
Species: Mouse, (male)
Application Route: Dermal
Dose: 56.3 mg/kg

Frequency of Treatment: 3 daily
Result: negative

bisphenol A**:**
Species: Rat, (male and female)
Application Route: Oral
Exposure time: 103 weeks
Frequency of Treatment: 7 daily
Result: negative

trientine**:**
Species: Mouse, (male)
Application Route: Dermal
Dose: 42 mg/kg
Frequency of Treatment: 3 daily
Method: OECD Test Guideline 451
Result: negative

Carcinogenicity - Assessment : No data available

Reproductive toxicity

Components:

diethylenetriamine**:**
Effects on fertility : Species: Rat, male and female
Application Route: Oral
General Toxicity - Parent: No observed adverse effect level: 30 mg/kg wet weight
Method: OECD Test Guideline 421

2-piperazin-1-ylethylamine**:**
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: No effects on fertility and early embryonic development were detected.

2,4,6-tris(dimethylaminomethyl)phenol**:**
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Remarks: No significant adverse effects were reported

bisphenol A**:**
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: Embryotoxic effects and adverse effects on the offspring were detected.

Components:

bis(isopropyl)naphthalene**:**
Effects on foetal : Species: Rat, female

development

Application Route: Oral
General Toxicity Maternal: Lowest observed adverse effect level: 250 mg/kg body weight
Method: Directive 67/548/EEC, Annex V, B.31.
Result: No teratogenic effects

diethylenetriamine:

Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 100 mg/kg body weight
Method: OECD Test Guideline 421

2-piperazin-1-ylethylamine:

Species: Rat, male and female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 224 - 285 mg/kg body weight
Method: OECD Test Guideline 422
Result: No teratogenic effects

bisphenol A:

Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 160 mg/kg body weight
Method: OECD Test Guideline 416
Result: No teratogenic effects

trientine:

Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: > 750 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rabbit
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level: 125 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Components:

bisphenol A:
Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

STOT - single exposure

Components:

diethylenetriamine:
Target Organs: Respiratory Tract

Assessment: May cause respiratory irritation.

bisphenol A**:**
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

bis(isopropyl)naphthalene**:**
Species: Rat, male and female
NOAEL: 170 mg/kg
Application Route: Ingestion
Exposure time: 4.320 hNumber of exposures: 7 d
Method: Subchronic toxicity

diethylenetriamine**:**
Species: Rat, male and female
: 70 - 80
Application Route: Ingestion
Test atmosphere: vapour
Exposure time: 360 hNumber of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
NOAEL: 114
Application Route: Skin contact
Exposure time: 9.600 hNumber of exposures: 6 d
Method: Chronic toxicity

2-piperazin-1-ylethylamine**:**
Species: Rat, male and female
NOAEL: 151 - 285
Application Route: Ingestion
Exposure time: 672 hMethod: Subacute toxicity

Species: Rat, male and female
NOAEL: > 1000
Application Route: Skin contact
Exposure time: 696 hNumber of exposures: 5 d
Method: Subacute toxicity

2,4,6-tris(dimethylaminomethyl)phenol**:**
Species: Rat, male and female
NOEL: 15 mg/kg
Application Route: Ingestion
Exposure time: 1.032 hNumber of exposures: 7 d
Method: Subacute toxicity

bisphenol A**:**
Species: Dog, male and female
: 75 mg/kg, 10
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 2.160 hNumber of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
LOAEL: 600 mg/kg
Application Route: Ingestion
Exposure time: 672 hNumber of exposures: 7 d
Method: Subchronic toxicity

trientine**:**
Species: Rat, male and female
NOAEL: 50 mg/kg
Application Route: Ingestion
Exposure time: 26 WeeksNumber of exposures: 7 d
Method: Subchronic toxicity

Repeated dose toxicity - Assessment : No data available

Aspiration toxicity
No data available

Experience with human exposure
General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution
No data available

Neurological effects
No data available

Further information

Ingestion: No data available

SECTION 12: Ecological information

12.1 Toxicity

Product:

Ecotoxicology Assessment
Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

Components:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1.000 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae : EC50 (No information available.): > 1.000 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

bis(isopropyl)naphthalene**:**

Toxicity to fish : LC50 : > 0,5 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.
Remarks: Aquatic toxicity is unlikely due to low solubility.

Toxicity to daphnia and other aquatic invertebrates : EC50 : > 0,16 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Marine water
Method: OECD Test Guideline 202
Remarks: Aquatic toxicity is unlikely due to low solubility.

EL50 (Daphnia magna (Water flea)): 1,7 mg/l
Exposure time: 48 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae : NOECr (Desmodesmus subspicatus (Scenedesmus subspicatus)): ca. 0,15 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Remarks: Aquatic toxicity is unlikely due to low solubility.

M-Factor (Acute aquatic : 1

toxicity)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0,013 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202

diethylenetriamine**:**

Toxicity to fish	:	LC50 : 430 mg/l Exposure time: 96 h Test Type: semi-static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.1.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 32 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water
Toxicity to algae	:	EbC50 (Selenastrum capricornutum (green algae)): 1.164 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to fish (Chronic toxicity)	:	NOEC: 10 mg/l Exposure time: 28 d Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 210
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 5,6 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.20
Toxicity to soil dwelling organisms	:	EC50: > 1.000 mg/kg Exposure time: 56 d Species: Eisenia fetida (earthworms) Method: OECD Test Guideline 222
Ecotoxicology Assessment Acute aquatic toxicity	:	This product has no known ecotoxicological effects.

2-piperazin-1-ylethylamine**:**

Toxicity to fish	:	LC50 : 2.190 mg/l Exposure time: 96 h Test Type: static test

Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 58 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202
Remarks: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Toxicity to algae : EC50 (Selenastrum capricornutum (green algae)): > 1.000 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201

2,4,6-tris(dimethylaminomethyl)phenol**:**

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 175 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : LC50 : 718 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Marine water

Toxicity to algae : ErC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): 84 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Ecotoxicology Assessment
Chronic aquatic toxicity : This product has no known ecotoxicological effects.

bisphenol A**:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 7,5 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 : 3,9 - 10,2 mg/l
Exposure time: 48 h

(Ceriodaphnia dubia (Water flea)):

Toxicity to algae : EC50 (Selenastrum capricornutum (green algae)): 2,5 - 3,1 mg/l
Exposure time: 96 h

Toxicity to fish (Chronic toxicity) : NOEC: 0,016 mg/l
Exposure time: 444 d
Species: Pimephales promelas (fathead minnow)
Test Type: flow-through test
Test substance: Fresh water
Method: Fish Life Cycle Toxicity

Remarks: Toxic to aquatic organisms.

Ecotoxicology Assessment
Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

trientine**:**

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 330 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: Fish Acute Toxicity Test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31,1 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.2.

Toxicity to algae : ErC50 (Selenastrum capricornutum (green algae)): 20 mg/l
Exposure time: 72 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to bacteria : EC50 (activated sludge): 800 mg/l
Exposure time: 0,5 h
Test Type: static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : EC10: 1,9 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Ecotoxicology Assessment
Acute aquatic toxicity : This product has no known ecotoxicological effects.

12.2 Persistence and degradability

Components:

2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**

Biodegradability : Result: Not readily biodegradable.

bis(isopropyl)naphthalene**:**

Biodegradability : Inoculum: activated sludge
Concentration: 0,2 mg/l
Result: Not readily biodegradable.
Biodegradation: 30 - 35 %
Exposure time: 56 d
Method: OECD Test Guideline 310

diethylenetriamine:

Biodegradability	:	Inoculum: activated sludge Result: Readily biodegradable Biodegradation: 87 % Exposure time: 21 d Method: OECD Test Guideline 301D
Photodegradation	:	Test Type: Air Rate constant: 500000 Degradation (direct photolysis): 50 %

2-piperazin-1-ylethylamine:

Biodegradability	:	Inoculum: activated sludge Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 28 d Method: OECD Test Guideline 301F
Biochemical Oxygen Demand (BOD)	:	5 mg/l Incubation time: 5 d
Chemical Oxygen Demand (COD)	:	560 mg/l
Photodegradation	:	Test Type: Air Degradation (direct photolysis): 50 % Test Type: Water

2,4,6-tris(dimethylaminomethyl)phenol:

Biodegradability	:	Inoculum: activated sludge Concentration: 2 mg/l Result: Not readily biodegradable. Biodegradation: 4 % Exposure time: 28 d Method: OECD Test Guideline 301D

bisphenol A:

Biodegradability	:	Result: Not readily biodegradable. Biodegradation: 1 - 2 % Exposure time: 28 d

trientine:

Biodegradability	:	Inoculum: activated sludge Result: Not readily biodegradable. Biodegradation: 0 % Exposure time: 162 d Method: OECD Test Guideline 301D Inoculum: activated sludge Result: Not readily biodegradable. Biodegradation: 20 % Exposure time: 84 d Method: Inherent Biodegradability: Modified SCAS Test

12.3 Bioaccumulative potential

Components:

bis(isopropyl)naphthalene:

Bioaccumulation	:	Species: Cyprinus carpio (Carp) Exposure time: 60 d Bioconcentration factor (BCF): 770 - 6.400 Test substance: Fresh water Method: flow-through test
Partition coefficient: n-octanol/water	:	log Pow: 6,081 Method: QSAR

diethylenetriamine:

Bioaccumulation	:	Species: Cyprinus carpio (Carp) Exposure time: 42 d Bioconcentration factor (BCF): 0,3 - 6,3 Test substance: Fresh water Method: flow-through test Remarks: Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water	:	log Pow: -1,58 (20 °C) pH: 7

2-piperazin-1-ylethylamine:

Bioaccumulation	:	Species: Fish Remarks: Does not bioaccumulate.
Partition coefficient: n-octanol/water	:	log Pow: -1,48 (20 °C)

2,4,6-tris(dimethylaminomethyl)phenol:

Partition coefficient: n-octanol/water	:	log Pow: 0,219 (21,5 °C) Method: OPPTS 830.7550

trientine:

Partition coefficient: n-octanol/water	:	log Pow: -2,65 (20 °C) Method: OECD Test Guideline 117

12.4 Mobility in soil

Components:

bis(isopropyl)naphthalene:

Distribution among environmental compartments	:	Koc: 36108Method: QSAR

diethylenetriamine:

Distribution among environmental compartments	:	Koc: 19111

2-piperazin-1-ylethylamine:

Distribution among environmental compartments	:	Koc: ca. 37000

trientine:
Distribution among environmental compartments : Koc: 1584,9 - 5012Method: OECD Test Guideline 106

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher..

12.6 Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

SECTION 14: Transport information

IATA

14.1 UN number : UN 2735

14.2 UN proper shipping name : Polyamines, liquid, corrosive, n.o.s.
(DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)

14.3 Transport hazard class(es) : 8

14.4 Packing group : II

Labels : Corrosive

Packing instruction (cargo aircraft) : 855

Packing instruction (passenger aircraft) : 851

IMDG

14.1 UN number	:	UN 2735
14.2 UN proper shipping name	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)
14.3 Transport hazard class(es)	:	8
14.4 Packing group	:	II
Labels	:	8
EmS Code	:	F-A, S-B
14.5 Environmental hazards		
Marine pollutant	:	yes

ADR

14.1 UN number	:	UN 2735
14.2 UN proper shipping name	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)
14.3 Transport hazard class(es)	:	8
14.4 Packing group	:	II
Labels	:	8
14.5 Environmental hazards		
Marine pollutant	:	no

RID

14.1 UN number	:	UN 2735
14.2 UN proper shipping name	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)
14.3 Transport hazard class(es)	:	8
14.4 Packing group	:	II
Labels	:	8
14.5 Environmental hazards		
Marine pollutant	:	no

Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	Not applicable
REACH - List of substances subject to authorisation (Annex IV)	:	Not applicable
MAL-Code-Number	:	5-5

The components of this product are reported in the following inventories:

TSCA	:	On the inventory, or in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
AICS	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory

Inventories

AICS (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TSCA (United States of America)

15.2 Chemical safety assessment

SECTION 16: Other information

Full text of H-Statements

H302	:	Harmful if swallowed.
H304	:	May be fatal if swallowed and enters airways.
H311	:	Toxic in contact with skin.
H312	:	Harmful in contact with skin.
H314	:	Causes severe skin burns and eye damage.
H315	:	Causes skin irritation.
H317	:	May cause an allergic skin reaction.
H318	:	Causes serious eye damage.
H330	:	Fatal if inhaled.
H335	:	May cause respiratory irritation.
H361f	:	Suspected of damaging fertility.
H410	:	Very toxic to aquatic life with long lasting effects.
H411	:	Toxic to aquatic life with long lasting effects.
H412	:	Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Aquatic Chronic	:	Chronic aquatic toxicity
Asp. Tox.	:	Aspiration hazard
Eye Dam.	:	Serious eye damage

Repr.	:	Reproductive toxicity
Skin Corr.	:	Skin corrosion
Skin Irrit.	:	Skin irritation
Skin Sens.	:	Skin sensitisation
STOT SE	:	Specific target organ toxicity - single exposure

Further information

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, E PRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT E IST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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CONFIDENTIAL

SAFETY DATA SHEET
LARGE SIZE COTTON TAKRAG

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

PRODUCT NAME	LARGE SIZE COTTON TAKRAG
PRODUCT NO.	D3052
APPLICATION	IMPREGNATED FABRIC WIPE
SUPPLIER	ORAPI APPLIED LIMITED, SPRING ROAD, SMETHWICK, WEST MIDLANDS, B66 1PT, ENGLAND Tel: 0121-525-4000 Fax: 0121-525-4919 Lee Baughan lee.baughan@orapiapplied.com
EMERGENCY TELEPHONE	0121 525 4000 (09:00 - 17:00 hrs)

2 HAZARDS IDENTIFICATION

Not regarded as a health or environmental hazard under current legislation.

3 COMPOSITION/INFORMATION ON INGREDIENTS

COMPOSITION COMMENTS

The material consists of 50% woven cotton and 50% non-drying resin. The details of the non-drying resin are given above. The highly refined mineral oil contains polycyclic aromatics at levels typically less than 0.01%.

4 FIRST-AID MEASURES

INHALATION

Not relevant.

INGESTION

Not relevant.

SKIN CONTACT

Not required - remove excess from skin after use.

EYE CONTACT

Promptly wash eyes with plenty of water while lifting the eye lids. Get medical attention promptly if symptoms occur after washing.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

This product is not flammable. Use fire-extinguishing media appropriate for surrounding materials.

SPECIAL FIRE FIGHTING PROCEDURES

No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS

Combustible, but does not burn readily.

SPECIFIC HAZARDS

Fire creates: Carbon dioxide (CO2). Carbon monoxide (CO).

PROTECTIVE MEASURES IN FIRE

Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Avoid heat, flames and other sources of ignition.

ENVIRONMENTAL PRECAUTIONS

Avoid discharge to the aquatic environment.

SPILL CLEAN UP METHODS

Non-hazardous substance. No specific clean-up procedure noted.

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7 HANDLING AND STORAGE

USAGE PRECAUTIONS

No specific usage precautions noted.

STORAGE PRECAUTIONS

Store at moderate temperatures in dry, well ventilated area.

STORAGE CLASS

Unspecified storage.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

INGREDIENT COMMENTS

No exposure limits noted for ingredient(s).

ENGINEERING MEASURES

No particular ventilation requirements.

RESPIRATORY EQUIPMENT

Respiratory protection not required.

HAND PROTECTION

Hand protection not required.

EYE PROTECTION

Not relevant.

HYGIENE MEASURES

Wash at the end of each work shift and before eating, smoking and using the toilet.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Impregnated tacky cotton wipe
COLOUR	Beige.
ODOUR	Mild
FLASH POINT (°C)	Is not flammable.

10 STABILITY AND REACTIVITY

STABILITY

Not relevant.

CONDITIONS TO AVOID

Avoid heat, flames and other sources of ignition.

MATERIALS TO AVOID

No incompatible groups noted.

HAZARDOUS DECOMPOSITION PRODUCTS

Fire creates: Carbon dioxide (CO_2). Carbon monoxide (CO).

11 TOXICOLOGICAL INFORMATION

GENERAL INFORMATION

No specific health warnings noted.

INHALATION

No specific health warnings noted.

INGESTION

No specific health warnings noted.

SKIN CONTACT

Skin irritation is not anticipated when used normally.

EYE CONTACT

May cause temporary eye irritation.

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12 ECOLOGICAL INFORMATION

ECOTOXICITY

Not regarded as dangerous for the environment.
Water Hazard Classification = WGK 0.

WATER HAZARD CLASSIFICATION

WGK 0

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

No specific disposal method required.

14 TRANSPORT INFORMATION

ROAD TRANSPORT NOTES	Not Classified
SEA TRANSPORT NOTES	Not Classified.

15 REGULATORY INFORMATION

RISK PHRASES

NC	Not classified.

SAFETY PHRASES

NC	Not classified.

UK REGULATORY REFERENCES

Chemicals (Hazard Information Packaging & Supply) Regulations 2002 (CHIP 3).

STATUTORY INSTRUMENTS

Chemicals (Hazard Information and Packaging) Regulations. Control of Substances Hazardous to Health.

APPROVED CODE OF PRACTICE

Safety Data Sheets for Substances and Preparations. Classification and Labelling of Substances and Preparations Dangerous for Supply.

16 OTHER INFORMATION

GENERAL INFORMATION

For further information or advice contact our technical service line during regular office hours on 0121-524-1000.

This safety data sheet has been compiled for the product as supplied, properties and hazards will vary if the product is diluted with water or mixed with any other material.

REVISION COMMENTS

The information contained herein is based on known available data believed to be reliable but does not constitute the users own assessment of the work place risk as required by other Health and Safety Legislation.

REVISION DATE	10-09-2007
SDS NO.	1

SAFETY DATA SHEET STATUS

Approved.

DATE	10-09-2007
SIGNATURE	Health & Safety Officer

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This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.

VESTAS PROPRIETARY NOTICE

HEMPADUR UNIQ 4774N

Protective Clothing	General Hazard	DOT

Conforms to ANSI Z400.1-2010 Standard - HCS 2012

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name :	HEMPADUR UNIQ 4774N
Product identity :	4774N20450
Product type :	epoxy primer (base for multi-component product)

1.2 Relevant identified uses of the substance or mixture and uses advised against

Field of application :	metal industry
Ready-for-use mixture :	4774A = 4774N 3 vol. / 9874A 1 vol.
Identified uses :	Industrial/Professional use
TSCA :	**Unless otherwise stated All components are listed or exempted.**

1.3 Details of the supplier of the safety data sheet

Company details :	HEMPEL (USA), Inc. 600 Conroe Park North Drive Conroe, Texas 77303 Toll free: (800) 678-6641, if outside area codes 713, 281, 409, 936 Regular phone number: (936) 523-6000 E-mail Hempel@Hempel.com

1.4 Emergency telephone number (with hours of operation)

For Transportation Emergencies : (24 hours)	CHEMTREC: **1-800-424-9300** (Toll-free in the U.S., Canada and the U.S. Virgin Islands) **703-527-3887** For calls originating elsewhere (Collect calls are accepted). Contract number: CCN10384 To preserve the effectiveness of arrangements for providing accurate and timely emergency response information, the basic identifying information (shipper name or contract number) must be included on shipping papers. If the purchaser of this product is going to be shipping this product to other locations, the purchaser must arrange for its own Emergency Information Provider to respond to transport incidents. Hempel's 24 hour response contract does not cover non-Hempel shipments.
For all other information : (8 AM - 5 PM CST)	In USA toll free calling available: 1-800- 678-6641 or (936)-523-6000 See Section 4 of the safety data sheet (first aid measures).

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status :	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910. 1200).
GHS Classification :	FLAMMABLE LIQUIDS - Category 3 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A SKIN SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

2.2 Label elements

SECTION 2: Hazards identification

Hazard pictograms :

Signal word : Warning

Hazard statements :
H226 - Flammable liquid and vapor.
H319 - Causes serious eye irritation.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H373 - May cause damage to organs through prolonged or repeated exposure.

Precautionary statements :

Prevention : Wear protective gloves. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Do not breathe vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response : Get medical attention if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : None known.

2.3 Other hazards

Hazards not otherwise classified : None known.

SECTION 3: Composition/information on ingredients

Product definition : Mixture

Physical state : Liquid.

Product/ingredient name	Identifiers	%	GHS Classification
bisphenol A-(epichlorhydrin) epoxy resin MW =< 700	25068-38-6	12.5 - 15	SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A SKIN SENSITIZATION - Category 1
xylene	1330-20-7	10 - 12.5	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 2
middle molecular epoxy resin MMW 700-1200	*25068-38-6	10 - 12.5	SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A SKIN SENSITIZATION - Category 1
n-butanol	71-36-3	1 - 3	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (oral) - Category 4 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation and Narcotic effects) - Category 3
ethylbenzene	100-41-4	1 - 3	FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (inhalation) - Category 4 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (ears) - Category 2 ASPIRATION HAZARD - Category 1
Methylstyrenated phenol	68512-30-1	1 - 3	SKIN CORROSION/IRRITATION - Category 2

SECTION 3: Composition/information on ingredients

1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	128554-52-9	0.5 - 1	SKIN SENSITIZATION - Category 1 SKIN SENSITIZATION - Category 1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Occupational exposure limits, if available, are listed in Section 8.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

SECTION 4: First aid measures

4.1 Description of first aid measures

General : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

If breathing is irregular, drowsiness, loss of consciousness or cramps: Call 911 and give immediate treatment (first aid).

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek immediate medical attention.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Give nothing by mouth. If unconscious, place in recovery position and get medical attention immediately.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

Ingestion : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do not induce vomiting unless directed to do so by medical personnel. Lower the head so that vomit will not re-enter the mouth and throat.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Ingestion : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Not applicable.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Extinguishing media : Recommended: alcohol resistant foam, CO_2, powders, water spray.
Not to be used: waterjet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous combustion products : Decomposition products may include the following materials: carbon oxides sulfur oxides halogenated compounds metal oxide/oxides

5.3 Advice for firefighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard. Cool closed containers exposed to fire with water. Do not release runoff from fire to drains or watercourses. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid all direct contact with the spilled material. Exclude sources of ignition and be aware of explosion hazard. Ventilate the area. Avoid breathing vapor or mist. Refer to protective measures listed in sections 7 and 8. No action shall be taken involving any personal risk or without suitable training. If the product contaminates lakes, rivers, or sewers, inform the appropriate authorities in accordance with local regulations.

6.2 Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and materials for containment and cleaning up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilled product.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Vapors are heavier than air and may spread along floors. Vapors may form explosive mixtures with air. Prevent the creation of flammable or explosive concentrations of vapors in air and avoid vapor concentrations higher than the occupational exposure limits. In addition, the product should be used only in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard. To dissipate static electricity during transfer, ground drum and connect to receiving container with bonding strap. No sparking tools should be used. Contains epoxy constituents. Avoid all possible skin contact with epoxy and amine containing products, they may cause allergic reactions.
Avoid inhalation of vapour, dust and spray mist. Avoid contact with skin and eyes. Eating, drinking and smoking should be prohibited in area where this material is handled, stored and processed. Appropriate personal protective equipment: see Section 8. Always keep in containers made from the same material as the original one.

SECTION 7: Handling and storage

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a cool, well-ventilated area away from incompatible materials and ignition sources. Keep out of the reach of children. Keep away from: Oxidizing agents, strong alkalis, strong acids. No smoking. Prevent unauthorized access. Containers that are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

See separate Product Data Sheet for recommendations or industrial sector specific solutions.
This product may be applied using several application techniques and methods of handling may be different for each. Application techniques include [but are not limited to] brushing, rolling, and spray application [conventional, HPLV, airless, pleural component or aerosol can]. Avoid the breathing of vapors and, if spraying, do not breath spray mist or aerosols.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Product/ingredient name	Exposure limit values
xylene	**ACGIH TLV (United States, 4/2014).** STEL: 651 mg/m³ 15 minutes. STEL: 150 ppm 15 minutes. TWA: 434 mg/m³ 8 hours. TWA: 100 ppm 8 hours. **OSHA PEL (United States, 2/2013).** TWA: 435 mg/m³ 8 hours. TWA: 100 ppm 8 hours.
n-butanol	**ACGIH TLV (United States, 4/2014).** TWA: 20 ppm 8 hours. **NIOSH REL (United States, 10/2013). Absorbed through skin.** CEIL: 150 mg/m³ CEIL: 50 ppm **OSHA PEL (United States, 2/2013).** TWA: 300 mg/m³ 8 hours. TWA: 100 ppm 8 hours.
ethylbenzene	**ACGIH TLV (United States, 4/2014).** TWA: 20 ppm 8 hours. **NIOSH REL (United States, 10/2013).** STEL: 545 mg/m³ 15 minutes. STEL: 125 ppm 15 minutes. TWA: 435 mg/m³ 10 hours. TWA: 100 ppm 10 hours. **OSHA PEL (United States, 2/2013).** TWA: 435 mg/m³ 8 hours. TWA: 100 ppm 8 hours.

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

8.2 Exposure controls

Appropriate engineering controls

Provide local exhaust and general ventilation systems to maintain airborne concentrations below OSHA, ACGIH, and manufacturer recommended exposure limits. Local exhaust ventilation is preferred because it prevents contaminant dispersion into work areas by controlling it at its source. Use local and general exhaust ventilation to effectively remove and prevent buildup of mists/vapors/fumes generated from the handling of this product.
Note: Local exhaust ventilation is designed to capture an emitted contaminant at or near its source, before the contaminant has a chance to disperse into the workplace air. General exhaust ventilation, also called dilution ventilation, is different from local exhaust ventilation because instead of capturing emissions at their source and removing them from the air, general exhaust ventilation allows the contaminant to be emitted into the workplace air and then dilutes the concentration of the contaminant to an acceptable level (e.g., to the PEL or below).

SECTION 8: Exposure controls/personal protection

Individual protection measures

General :	Gloves must be worn for all work that may result in soiling. Apron/coveralls/protective clothing must be worn when soiling is so great that regular work clothes do not adequately protect skin against contact with the product. Safety eyewear should be used when there is a likelihood of exposure.
Hygiene measures :	Wash hands, forearms, and face thoroughly after handling compounds and before eating, smoking, using lavatory, and at the end of day.
Eye/face protection :	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
Hand protection :	Wear chemical-resistant gloves in combination with 'basic' employee training. The quality of the chemical-resistant protective gloves must be chosen as a function of the specific workplace concentrations and quantity of hazardous substances. Since the actual work situation is unknown. Supplier of gloves should be contacted in order to find the appropriate type. Below listed glove(s) should be regarded as generic advice: Recommended: Silver Shield / 4H gloves, polyvinyl alcohol (PVA), Viton® May be used: nitrile rubber, butyl rubber Not recommended: neoprene rubber, natural rubber (latex), polyvinyl chloride (PVC)
Body protection :	Personal protective equipment for the body should be selected based on the task being performed and the risks involved handling this product. Wear suitable protective clothing. Always wear protective clothing when spraying.
Respiratory protection :	If working areas have insufficient ventilation, wear half or totally covering mask equipped with gas filter of type Organic Vapor, when grinding use particle filter of type P95, P99 or P100. When spraying use a combined filter (organic vapor / HEPA or organic vapor / P100 type). Be sure to use approved/certified respirator or equivalent. Always wear an air-fed respirator when spraying in a continuous and prolonged work situation (e.g. hood with supply of fresh or compressed air or a full face, powered air purifying filter).
Protective clothing (pictograms) :	 Note: Application of paint products by spraying requires additional safety precautions: Full body suit, Full face respirator with air supplied.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state :	Liquid.
Odor :	Solvent-like
pH :	Testing not relevant or not possible due to nature of the product.
Melting point/freezing point :	Testing not relevant or not possible due to nature of the product.
Boiling point/boiling range :	Testing not relevant or not possible due to nature of the product.
Flash point :	Closed cup: 26°C (78.8°F)
Evaporation rate :	Testing not relevant or not possible due to nature of the product.
Flammability :	Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Upper/lower flammability or explosive limits :	0.8 - 11.3 vol %
Vapor pressure :	Testing not relevant or not possible due to nature of the product.

SECTION 9: Physical and chemical properties

Vapor density :	Testing not relevant or not possible due to nature of the product.
Relative density :	1.722 g/cm³
Solubility(ies) :	Partially soluble in the following materials: cold water and hot water.
Partition coefficient (LogKow) :	Testing not relevant or not possible due to nature of the product.
Auto-ignition temperature :	Testing not relevant or not possible due to nature of the product.
Decomposition temperature :	Testing not relevant or not possible due to nature of the product.
Viscosity :	Testing not relevant or not possible due to nature of the product.
Explosive properties :	Highly explosive in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Oxidizing properties :	Testing not relevant or not possible due to nature of the product.

9.2 Other information

Solvent(s) % by weight (Included excempt solvent(s)):	15.7 % (w/w)
Water % by weight :	Weighted average: 0 %
VOC content (Coatings) :	2.25 lbs/gal (269.9 g/l)
VOC content (Regulatory) :	2.25 lbs/gal (269.9 g/l)
TOC Content (Volatile) :	Weighted average: 232 g/l
Solvent Gas :	Weighted average: 0.067 m³/l

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

The product is stable.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials

Highly reactive or incompatible with the following materials: oxidizing materials.
Reactive or incompatible with the following materials: reducing materials.

10.6 Hazardous decomposition products

When exposed to high temperatures (i.e. in case of fire) harmful decomposition products may be formed:

Decomposition products may include the following materials: carbon oxides sulfur oxides halogenated compounds metal oxide/oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Exposure to component solvent vapor concentrations may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Solvents may cause some of the above effects by absorption through the skin. Symptoms and signs include headaches, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin. If splashed in the eyes, the liquid may cause irritation and reversible damage. Accidental swallowing may cause stomach pain. Chemical lung inflammation may occur if the product is taken into the lungs via vomiting.
Epoxy and amine containing products can cause skin disorders such as allergic eczema. The allergy may arise after only a short exposure period.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
bisphenol A-(epichlorhydrin) epoxy resin MW =< 700	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>2000 mg/kg	-
xylene	LC50 Inhalation Gas.	Rat	5000 ppm	4 hours
	LC50 Inhalation Vapor	Rat	6350 ppm	4 hours
	LD50 Oral	Rat	4300 mg/kg	-
n-butanol	LC50 Inhalation Vapor	Rat	24000 mg/m³	4 hours
	LD50 Dermal	Rabbit	3400 mg/kg	-
	LD50 Oral	Rat	790 mg/kg	-
ethylbenzene	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-
Methylstyrenated phenol	LC50 Inhalation Dusts and mists	Rat	>5 mg/l	4 hours
	LD50 Dermal	Rat	>2000 mg/kg	-
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>2000 mg/kg	-

Acute toxicity estimates

Route	ATE value
Oral	15924 mg/kg
Dermal	9601.4 mg/kg
Inhalation (gases)	37722.2 ppm
Inhalation (vapors)	84.65 mg/l

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure
bisphenol A-(epichlorhydrin) epoxy resin MW =< 700	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams
	Skin - Moderate irritant	Rabbit	-	24 hours 500 microliters
xylene	Eyes - Severe irritant	Rabbit	-	24 hours 5 milligrams
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams
n-butanol	Eyes - Severe irritant	Rabbit	-	24 hours 2 milligrams
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams
ethylbenzene	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams
	Respiratory - Mild irritant	Rabbit	-	-
	Eyes - Mild irritant	Rabbit	-	-
Methylstyrenated phenol	Eyes - Mild irritant	Rabbit	-	-

Carcinogen Classification

Product/ingredient name	IARC	NTP	OSHA
xylene	3	-	-
ethylbenzene	2B	-	-

Specific target organ toxicity (single exposure)

SECTION 11: Toxicological information

Product/ingredient name	Category	Route of exposure	Target organs
n-butanol	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
ethylbenzene	Category 2	Not determined	ears

Aspiration hazard

Product/ingredient name	Result
ethylbenzene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure

Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential chronic health effects

Sensitization : Contains bisphenol A-(epichlorhydrin) epoxy resin MW =< 700, middle molecular epoxy resin MMW 700-1200, Methylstyrenated phenol, 1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene. May produce an allergic reaction.

Other information : No additional known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Do not allow to enter drains or watercourses. Harmful to aquatic life with long lasting effects.

When spilled, this product may act as an oil, causing a film, sheen, emulsion, or sludge at or beneath the surface of a body of water. Oils of any kind can cause: (a) drowning of waterfowl due to lack of buoyancy, loss of insulating capacity of feathers, starvation and vulnerability to predators due to lack of mobility; (b) lethal effect on fish by coating gill surfaces, preventing respiration; (c) potential fish kills resulting from alteration in biochemical oxygen demand; (d) asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom; and (e) adverse aesthetic effects of fouled shoreline and beaches.

Product/ingredient name	Result	Species	Exposure
bisphenol A-(epichlorhydrin) epoxy resin MW =< 700	Acute EC50 >11 mg/l	Algae	72 hours
	Acute EC50 1.4 - 1.7 mg/l	Daphnia - Daphnia magna	48 hours
	Acute LC50 3.1 mg/l	Fish - fathead minnow (Pimephales promelas)	96 hours
n-butanol	Acute EC50 1328 mg/l	Daphnia	96 hours
	Acute LC50 1.376 mg/l	Fish	96 hours
ethylbenzene	Chronic NOEC <1000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
Methylstyrenated phenol	Acute EC50 15 mg/l	Algae	72 hours
	Acute EC50 14 - 51 mg/l	Daphnia	48 hours
	Acute EC50 25.8 mg/l	Fish	96 hours
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	LC50 >100 mg/l	Fish	96 hours

12.2 Persistence and degradability

SECTION 12: Ecological information

Product/ingredient name	Test	Result	Dose	Inoculum
bisphenol A-(epichlorhydrin) epoxy resin MW =< 700	OECD 302B Inherent Biodegradability: Zahn-Wellens/EMPA Test	12 % - Not readily - 28 days	-	-
xylene	-	>60 % - Readily - 28 days	-	-
n-butanol	OECD 301D Ready Biodegradability - Closed Bottle Test	92 % - 20 days	-	-
ethylbenzene	-	>70 % - Readily - 28 days	-	-
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	-	5 % - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
bisphenol A-(epichlorhydrin) epoxy resin MW =< 700	-	12%; 28 day(s)	Not readily
xylene	-	-	Readily
n-butanol	-	-	Readily
ethylbenzene	-	-	Readily
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
bisphenol A-(epichlorhydrin) epoxy resin MW =< 700	2.64 - 3.78	31	low
xylene	3.12	8.1 - 25.9	low
middle molecular epoxy resin MMW 700-1200	2.64 - 3.78	31	low
n-butanol	1	3.16	low
ethylbenzene	3.6	-	low
Methylstyrenated phenol	3.627	-	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : No known data avaliable in our database.

Mobility : No known data avaliable in our database.

12.5 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.
The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.
Refer to Section 7 and Section 8 for additional handling information and protection of employees.

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled

SECTION 13: Disposal considerations

material and runoff and contact with soil, waterways, drains and sewers.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
1-Butanol (I); n-Butyl alcohol (I) Xylene	71-36-3 1330-20-7	Listed Listed	U031 U239

SECTION 14: Transport information

Transport may take place according to national regulation or DOT for transport by road and by train, IMDG for transport by sea, IATA for Air shipment. Refer to specific Dangerous Goods Transport requirements under 49CFR, ICAO and IATA.

	14.1 UN no.	14.2 Proper shipping name	14.3 Transport hazard class(es)	14.4 PG*	14.5 Env*	Additional information
DOT Code	UN1263	PAINT. (bisphenol A-(epichlorhydrin) epoxy resin MW =< 700)	3 -	III	Yes.	**ERG : 128** The marine pollutant mark is not required when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes. **Reportable quantity** (xylene, ethylbenzene) 936.37 lbs / 425.11 kg [65.216 gal / 246.87 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
TDG Code	UN1263	PAINT. (bisphenol A-(epichlorhydrin) epoxy resin MW =< 700)	3 -	III	Yes.	The marine pollutant mark is not required when transported by road or rail.
SCT Code	UN1263	PAINT	3 -	III	No.	-
IMDG Code	UN1263	PAINT. (bisphenol A-(epichlorhydrin) epoxy resin MW =< 700)	3 -	III	Yes.	The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg. **Emergency schedules (EmS)** F-E, S-E
IATA Code	UN1263	PAINT	3 -	III	No.	The environmentally hazardous substance mark may appear if required by other transportation regulations.

Code : Classification
PG* : Packing group
Env.* : Environmental hazards

14.6 Special precautions for user

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Federal regulations : All components are listed or exempted.

TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

Clean Water Act (CWA) 307: phenol; ethylbenzene

Clean Water Act (CWA) 311: epichlorohydrin; phenol; ethylbenzene; xylene

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304 - SARA 311/312:

SARA 302/304: chlorine; epichlorohydrin; phenol
SARA 311/312 Hazards identification: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

Product/ingredient name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
bisphenol A-(epichlorhydrin) epoxy resin MW =< 700	10 - 25	No.	No.	No.	Yes.	No.
xylene	10 - 25	Yes.	No.	No.	Yes.	No.
middle molecular epoxy resin MMW 700-1200	10 - 25	No.	No.	No.	Yes.	No.
n-butanol	1 - 3	Yes.	No.	No.	Yes.	No.
ethylbenzene	1 - 3	Yes.	No.	No.	Yes.	Yes.
Methylstyrenated phenol	1 - 3	No.	No.	No.	Yes.	No.
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	0.5 - 1	No.	No.	No.	Yes.	No.

SARA 313 : SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

Form R - Reporting requirements :

Product/ingredient name	CAS number	Concentration
xylene	1330-20-7	10 - 20
n-butanol	71-36-3	1 - 3
ethylbenzene	100-41-4	1 - 3

Supplier notification :

Product/ingredient name	CAS number	Concentration
xylene	1330-20-7	10 - 20
middle molecular epoxy resin MMW 700-1200	*25068-38-6	10 - 20
n-butanol	71-36-3	1 - 3
ethylbenzene	100-41-4	1 - 3

State regulations :

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: The following components are listed: BARIUM SULFATE; TITANIUM DIOXIDE; N-BUTYL ALCOHOL; ETHYL BENZENE; XYLENE
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: The following components are listed: BARIUM SULFATE; SULFURIC ACID, BARIUM SALT (1:1); TITANIUM DIOXIDE; TITANIUM OXIDE (TiO2); n-BUTYL ALCOHOL; 1-BUTANOL; ETHYL BENZENE; BENZENE, ETHYL-; XYLENES; BENZENE, DIMETHYL-
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: The following components are listed: Butyl alcohol; 1-Butanol; Ethylbenzene; Xylene (mixed)

SECTION 15: Regulatory information

New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: The following components are listed: BARIUM SULFATE; TITANIUM OXIDE (TIO2); 1-BUTANOL; BENZENE, ETHYL-; BENZENE, DIMETHYL-
Rhode Island Hazardous Substances: None of the components are listed.

California Prop. 65 PFF :

WARNING: This product contains a chemical known to the State of California to cause cancer.
WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

Product/ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
titanium dioxide	Yes.	No.	No.	No.
ethylbenzene	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
respirable quartz	Yes.	No.	No.	No.
2-phenylpropene	Yes.	Yes.	No.	No.
methanol	No.	Yes.	No.	23000 µg/day (ingestion) 47000 µg/day (inhalation)
epichlorohydrin	Yes.	Yes.	Yes.	No.

SECTION 16: Other information

Remarks : Note: In USA, consult Code of Federal Regulations, Title 29, Labor, Parts 1910 and 1915 concerning occupational safety and health standards and regulations, as well as any other applicable Federal, State or local regulations that apply to safe practices in coating operations.
Warning! If you scrape, sand, or remove old paint, you may release lead dust. LEAD is TOXIC.

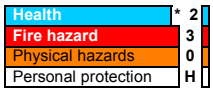
Validation : Validated by Company on 3/10/2015.

GHS Classification

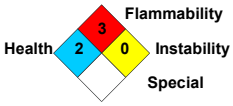
Procedure used to derive the classification.

Classification	Justification
FLAMMABLE LIQUIDS - Category 3	On basis of test data
SKIN CORROSION/IRRITATION - Category 2	Calculation method
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A	Calculation method
SKIN SENSITIZATION - Category 1	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2	Calculation method

Hazardous Material Information System (U.S.A.)



National Fire Protection Association (U.S.A.)



Personal Protective Equipment (PPE) shown in this section is a suggestion. Since conditions vary from one work location to another consult the facility safety & health program. Customer or end user is responsible to evaluate worker exposure conditions at the site of application and determine the appropriate PPE suitable for workers at that particular facility or location.

Abbreviations and acronyms :

ANSI = American National Standards Institute
HCS = Hazardous Communication System
TSCA = Toxic Substances Control Act
CFR = Code of federal Regulations
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
OSHA = United States Occupational Health and Safety Administration
NIOSH = National Institute for Occupational Safety and Health
ACGIH = American Conference of Industrial Hygienists
IARC = International Agency for Research on Cancer.
NTP = National Toxicology Program
ATE = Acute Toxicity Estimate

OECD = Organisation for Economic Co-operation and Development
BCF = Bioconcentration Factor
DOT = United States Department of Transportation
ERG = Emergency Response Guide
TDG = Transport of Dangerous Goods, Canada
SCT = Transportation & Communications Ministry, Mexico
IMDG = International Maritime Dangerous Goods
IATA = International Air Transport Association
SARA = Superfund Amendments Reauthorization Act
EPCRA = Emergency Planning and Community Right to Know Act

Notice to reader

Indicates information that has changed from previously issued version.

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

HEMPATHANE HS 5561P

Protective Clothing	General Hazard	DOT

Conforms to ANSI Z400.1-2010 Standard - HCS 2012

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name :	HEMPATHANE HS 5561P
Product identity :	5561P11150
Product type :	polyurethane topcoat (base for multi-component product)

1.2 Relevant identified uses of the substance or mixture and uses advised against

Field of application :	metal industry
Ready-for-use mixture :	5561B = 5561P 7 vol. / 97050 1 vol.
Identified uses :	Industrial/Professional use
TSCA :	**Unless otherwise stated All components are listed or exempted.**

1.3 Details of the supplier of the safety data sheet

Company details :	HEMPEL (USA), Inc. 600 Conroe Park North Drive Conroe, Texas 77303 Toll free: (800) 678-6641, if outside area codes 713, 281, 409, 936 Regular phone number: (936) 523-6000 E-mail Hempel@Hempel.com

1.4 Emergency telephone number (with hours of operation)

For Transportation Emergencies : (24 hours)	CHEMTREC: **1-800-424-9300** (Toll-free in the U.S., Canada and the U.S. Virgin Islands) **703-527-3887** For calls originating elsewhere (Collect calls are accepted). Contract number: CCN10384 To preserve the effectiveness of arrangements for providing accurate and timely emergency response information, the basic identifying information (shipper name or contract number) must be included on shipping papers. If the purchaser of this product is going to be shipping this product to other locations, the purchaser must arrange for its own Emergency Information Provider to respond to transport incidents. Hempel's 24 hour response contract does not cover non-Hempel shipments.
For all other information : (8 AM - 5 PM CST)	In USA toll free calling available: 1-800- 678-6641 or (936)-523-6000 See Section 4 of the safety data sheet (first aid measures).

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status :	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910. 1200).
GHS Classification :	FLAMMABLE LIQUIDS - Category 3 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A SKIN SENSITIZATION - Category 1

2.2 Label elements

SECTION 2: Hazards identification

Hazard pictograms :

Signal word : Warning

Hazard statements :
H226 - Flammable liquid and vapor.
H319 - Causes serious eye irritation.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.

Precautionary statements :

Prevention : Wear protective gloves. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response : IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation or rash occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : None known.

2.3 Other hazards

Hazards not otherwise classified : None known.

SECTION 3: Composition/information on ingredients

Product definition : Mixture

Physical state : Liquid.

Product/ingredient name	Identifiers	%	GHS Classification
solvent naphtha (petroleum), light arom.	64742-95-6	12.5 - 15	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 ASPIRATION HAZARD - Category 1
n-butyl acetate	123-86-4	5 - 10	FLAMMABLE LIQUIDS - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
xylene	1330-20-7	3 - 5	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 2
1,2,4-trimethylbenzene	95-63-6	3 - 5	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	128554-52-9	0.5 - 1	SKIN SENSITIZATION - Category 1

SECTION 3: Composition/information on ingredients

bis (1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	41556-26-7	0.3 - 0.5	SKIN SENSITIZATION - Category 1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Occupational exposure limits, if available, are listed in Section 8.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

SECTION 4: First aid measures

4.1 Description of first aid measures

General : In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

If breathing is irregular, drowsiness, loss of consciousness or cramps: Call 911 and give immediate treatment (first aid).

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. In all cases of doubt, or when symptoms persist, seek medical attention.

Inhalation : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Give nothing by mouth. If unconscious, place in recovery position and get medical attention immediately.

Skin contact : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.

Ingestion : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do not induce vomiting unless directed to do so by medical personnel. Lower the head so that vomit will not re-enter the mouth and throat.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Not applicable.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Extinguishing media :	Recommended: alcohol resistant foam, CO_2, powders, water spray. Not to be used: waterjet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture :	Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous combustion products :	Decomposition products may include the following materials: carbon oxides sulfur oxides metal oxide/ oxides

5.3 Advice for firefighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard. Cool closed containers exposed to fire with water. Do not release runoff from fire to drains or watercourses. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid all direct contact with the spilled material. Exclude sources of ignition and be aware of explosion hazard. Ventilate the area. Avoid breathing vapor or mist. Refer to protective measures listed in sections 7 and 8. No action shall be taken involving any personal risk or without suitable training. If the product contaminates lakes, rivers, or sewers, inform the appropriate authorities in accordance with local regulations.

6.2 Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material.

6.3 Methods and materials for containment and cleaning up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilled product.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Vapors are heavier than air and may spread along floors. Vapors may form explosive mixtures with air. Prevent the creation of flammable or explosive concentrations of vapors in air and avoid vapor concentrations higher than the occupational exposure limits. In addition, the product should be used only in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard. To dissipate static electricity during transfer, ground drum and connect to receiving container with bonding strap. No sparking tools should be used.
Avoid inhalation of vapour, dust and spray mist. Avoid contact with skin and eyes. Eating, drinking and smoking should be prohibited in area where this material is handled, stored and processed. Appropriate personal protective equipment: see Section 8. Always keep in containers made from the same material as the original one.

7.2 Conditions for safe storage, including any incompatibilities

SECTION 7: Handling and storage

Store in accordance with local regulations. Store in a cool, well-ventilated area away from incompatible materials and ignition sources. Keep out of the reach of children. Keep away from: Oxidizing agents, strong alkalis, strong acids. No smoking. Prevent unauthorized access. Containers that are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)

See separate Product Data Sheet for recommendations or industrial sector specific solutions.
This product may be applied using several application techniques and methods of handling may be different for each. Application techniques include [but are not limited to] brushing, rolling, and spray application [conventional, HPLV, airless, pleural component or aerosol can]. Avoid the breathing of vapors and, if spraying, do not breath spray mist or aerosols.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Product/ingredient name	Exposure limit values
solvent naphtha (petroleum), light arom.	**ACGIH TLV (United States).** TWA Tentative: 25 ppm 8 hours.
n-butyl acetate	**ACGIH TLV (United States, 4/2014).** STEL: 200 ppm 15 minutes. TWA: 150 ppm 8 hours. **NIOSH REL (United States, 10/2013).** STEL: 950 mg/m³ 15 minutes. STEL: 200 ppm 15 minutes. TWA: 710 mg/m³ 10 hours. TWA: 150 ppm 10 hours. **OSHA PEL (United States, 2/2013).** TWA: 710 mg/m³ 8 hours. TWA: 150 ppm 8 hours.
xylene	**ACGIH TLV (United States, 4/2014).** STEL: 651 mg/m³ 15 minutes. STEL: 150 ppm 15 minutes. TWA: 434 mg/m³ 8 hours. TWA: 100 ppm 8 hours. **OSHA PEL (United States, 2/2013).** TWA: 435 mg/m³ 8 hours. TWA: 100 ppm 8 hours.
1,2,4-trimethylbenzene	**ACGIH TLV (United States, 4/2014).** TWA: 123 mg/m³ 8 hours. TWA: 25 ppm 8 hours. **NIOSH REL (United States, 10/2013).** TWA: 125 mg/m³ 10 hours. TWA: 25 ppm 10 hours.

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

8.2 Exposure controls

Appropriate engineering controls

Provide local exhaust and general ventilation systems to maintain airborne concentrations below OSHA, ACGIH, and manufacturer recommended exposure limits. Local exhaust ventilation is preferred because it prevents contaminant dispersion into work areas by controlling it at its source. Use local and general exhaust ventilation to effectively remove and prevent buildup of mists/vapors/fumes generated from the handling of this product.
Note: Local exhaust ventilation is designed to capture an emitted contaminant at or near its source, before the contaminant has a chance to disperse into the workplace air. General exhaust ventilation, also called dilution ventilation, is different from local exhaust ventilation because instead of capturing emissions at their source and removing them from the air, general exhaust ventilation allows the contaminant to be emitted into the workplace air and then dilutes the concentration of the contaminant to an acceptable level (e.g., to the PEL or below).

Individual protection measures

SECTION 8: Exposure controls/personal protection

General :	Gloves must be worn for all work that may result in soiling. Apron/coveralls/protective clothing must be worn when soiling is so great that regular work clothes do not adequately protect skin against contact with the product. Safety eyewear should be used when there is a likelihood of exposure.
Hygiene measures :	Wash hands, forearms, and face thoroughly after handling compounds and before eating, smoking, using lavatory, and at the end of day.
Eye/face protection :	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
Hand protection :	Wear chemical-resistant gloves in combination with 'basic' employee training. The quality of the chemical-resistant protective gloves must be chosen as a function of the specific workplace concentrations and quantity of hazardous substances. Since the actual work situation is unknown. Supplier of gloves should be contacted in order to find the appropriate type. Below listed glove(s) should be regarded as generic advice: Recommended: Silver Shield / 4H gloves, polyvinyl alcohol (PVA), Viton® May be used: nitrile rubber Not recommended: neoprene rubber, butyl rubber, natural rubber (latex), polyvinyl chloride (PVC)
Body protection :	Personal protective equipment for the body should be selected based on the task being performed and the risks involved handling this product. Wear suitable protective clothing. Always wear protective clothing when spraying.
Respiratory protection :	If working areas have insufficient ventilation, wear half or totally covering mask equipped with gas filter of type Organic Vapor, when grinding use particle filter of type P95, P99 or P100. When spraying use a combined filter (organic vapor / HEPA or organic vapor / P100 type). Be sure to use approved/certified respirator or equivalent. Always wear an air-fed respirator when spraying in a continuous and prolonged work situation (e.g. hood with supply of fresh or compressed air or a full face, powered air purifying filter).
Protective clothing (pictograms) :	 Note: Application of paint products by spraying requires additional safety precautions: Full body suit, Full face respirator with air supplied.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state :	Liquid.
Odor :	Solvent-like
pH :	Testing not relevant or not possible due to nature of the product.
Melting point/freezing point :	Testing not relevant or not possible due to nature of the product.
Boiling point/boiling range :	Testing not relevant or not possible due to nature of the product.
Flash point :	Closed cup: 35°C (95°F)
Evaporation rate :	Testing not relevant or not possible due to nature of the product.
Flammability :	Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. Flammable in the presence of the following materials or conditions: oxidizing materials. Slightly flammable in the presence of the following materials or conditions: reducing materials.
Upper/lower flammability or explosive limits :	0.8 - 7.6 vol %
Vapor pressure :	Testing not relevant or not possible due to nature of the product.

SECTION 9: Physical and chemical properties

Vapor density :	Testing not relevant or not possible due to nature of the product.
Relative density :	1.407 g/cm³
Solubility(ies) :	Insoluble in the following materials: cold water and hot water.
Partition coefficient (LogKow) :	Testing not relevant or not possible due to nature of the product.
Auto-ignition temperature :	Testing not relevant or not possible due to nature of the product.
Decomposition temperature :	Testing not relevant or not possible due to nature of the product.
Viscosity :	Testing not relevant or not possible due to nature of the product.
Explosive properties :	Slightly explosive in the presence of the following materials or conditions: open flames, sparks and static discharge.
Oxidizing properties :	Testing not relevant or not possible due to nature of the product.

9.2 Other information

Solvent(s) % by weight (Included excempt solvent(s)):	28.4 % (w/w)
Water % by weight :	Weighted average: 0 %
VOC content (Coatings) :	3.34 lbs/gal (400 g/l)
VOC content (Regulatory) :	3.34 lbs/gal (400 g/l)
TOC Content (Volatile) :	Weighted average: 319 g/l
Solvent Gas :	Weighted average: 0.084 m³/l

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

The product is stable.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials

Highly reactive or incompatible with the following materials: oxidizing materials.
Reactive or incompatible with the following materials: acids.
Slightly reactive or incompatible with the following materials: reducing materials.

10.6 Hazardous decomposition products

When exposed to high temperatures (i.e. in case of fire) harmful decomposition products may be formed:

Decomposition products may include the following materials: carbon oxides sulfur oxides metal oxide/oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Exposure to component solvent vapor concentrations may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Solvents may cause some of the above effects by absorption through the skin. Symptoms and signs include headaches, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin. If splashed in the eyes, the liquid may cause irritation and reversible damage. Accidental swallowing may cause stomach pain. Chemical lung inflammation may occur if the product is taken into the lungs via vomiting.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
solvent naphtha (petroleum), light arom.	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	3592 mg/kg	-
n-butyl acetate	LC50 Inhalation Vapor	Rat	>21 mg/l	4 hours
	LD50 Dermal	Rabbit	>17600 mg/kg	-
	LD50 Oral	Rat	10768 mg/kg	-
xylene	LC50 Inhalation Gas.	Rat	5000 ppm	4 hours
	LC50 Inhalation Vapor	Rat	6350 ppm	4 hours
	LD50 Oral	Rat	4300 mg/kg	-
1,2,4-trimethylbenzene	LC50 Inhalation Vapor	Rat	18000 mg/m³	4 hours
	LD50 Oral	Rat	5 g/kg	-
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>2000 mg/kg	-
bis (1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	>2000 mg/kg	-

Acute toxicity estimates

Route	ATE value
Oral	19480.2 mg/kg
Dermal	28875.3 mg/kg
Inhalation (gases)	68053 ppm
Inhalation (vapors)	58.75 mg/l

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure
solvent naphtha (petroleum), light arom.	Eyes - Mild irritant	Rabbit	-	24 hours 100 microliters
	Respiratory - Mild irritant	Rabbit	-	-
n-butyl acetate	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams
	Eyes - Mild irritant	Rabbit	-	-
	Respiratory - Mild irritant	Rabbit	-	-
xylene	Eyes - Severe irritant	Rabbit	-	24 hours 5 milligrams
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams

Sensitizer

Product/ingredient name	Route of exposure	Species	Result
bis (1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	skin	Guinea pig	Sensitizing

Carcinogen Classification

Product/ingredient name	IARC	NTP	OSHA
xylene	3	-	-

Specific target organ toxicity (single exposure)

SECTION 11: Toxicological information

Product/ingredient name	Category	Route of exposure	Target organs
solvent naphtha (petroleum), light arom.	Category 3	Not applicable.	Respiratory tract irritation
n-butyl acetate	Category 3	Not applicable.	Narcotic effects
1,2,4-trimethylbenzene	Category 3	Not applicable.	Respiratory tract irritation

Aspiration hazard

Product/ingredient name	Result
solvent naphtha (petroleum), light arom.	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure

Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential chronic health effects

Sensitization : Contains 1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene, bis (1,2,2,6,6-pentamethyl-4-piperidyl) sebacate. May produce an allergic reaction.

Other information : No additional known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Do not allow to enter drains or watercourses. Harmful to aquatic life with long lasting effects.

When spilled, this product may act as an oil, causing a film, sheen, emulsion, or sludge at or beneath the surface of a body of water. Oils of any kind can cause: (a) drowning of waterfowl due to lack of buoyancy, loss of insulating capacity of feathers, starvation and vulnerability to predators due to lack of mobility; (b) lethal effect on fish by coating gill surfaces, preventing respiration; (c) potential fish kills resulting from alteration in biochemical oxygen demand; (d) asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom; and (e) adverse aesthetic effects of fouled shoreline and beaches.

Product/ingredient name	Result	Species	Exposure
solvent naphtha (petroleum), light arom.	Acute EC50 2.6 mg/l	Algae - Pseudokirchneriella subcapitata (green algae)	96 hours
	Acute EC50 6.14 mg/l	Daphnia - Daphnia magna	48 hours
	Acute LC50 9.22 mg/l	Fish - Oncorhynchus mykiss (rainbow trout)	96 hours
n-butyl acetate	Acute EC50 44 mg/l	Daphnia	48 hours
1,2,4-trimethylbenzene	Acute LC50 4910 µg/l Marine water	Crustaceans - Elasmopus pectinicrus - Adult	48 hours
	Acute LC50 7720 µg/l Fresh water	Fish - Pimephales promelas	96 hours
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	LC50 >100 mg/l	Fish	96 hours
bis (1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	Acute EC50 1.68 mg/l	Aquatic plants	72 hours
	Acute LC50 0.97 mg/l Fresh water	Fish - Lepomis macrochirus	96 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
solvent naphtha (petroleum), light arom.	-	>70 % - Readily - 28 days	-	-
n-butyl acetate	-	90 % - Readily - 28 days	-	-
xylene	-	>60 % - Readily - 28 days	-	-
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	-	5 % - 28 days	-	-

SECTION 12: Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
solvent naphtha (petroleum), light arom.	-	-	Readily
n-butyl acetate	-	-	Readily
xylene	-	-	Readily
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
solvent naphtha (petroleum), light arom.	-	10 - 2500	high
n-butyl acetate	2.3	-	low
xylene	3.12	8.1 - 25.9	low
1,2,4-trimethylbenzene	3.63	243	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : No known data avaliable in our database.

Mobility : No known data avaliable in our database.

12.5 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.
The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.
Refer to Section 7 and Section 8 for additional handling information and protection of employees.

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Xylene	1330-20-7	Listed	U239

SECTION 14: Transport information

Transport may take place according to national regulation or DOT for transport by road and by train, IMDG for transport by sea, IATA for Air shipment. Refer to specific Dangerous Goods Transport requirements under 49CFR, ICAO and IATA.

	14.1 UN no.	14.2 Proper shipping name	14.3 Transport hazard class(es)	14.4 PG*	14.5 Env*	Additional information
DOT Code	UN1263	PAINT	3 -	III	No.	**ERG : 128** **Reportable quantity** (xylene) 2623.6 lbs / 1191.1 kg [223.63 gal / 846.55 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
TDG Code	UN1263	PAINT	3 -	III	No.	-
SCT Code	UN1263	PAINT	3 -	III	No.	-
IMDG Code	UN1263	PAINT	3 -	III	No.	**Emergency schedules (EmS)** F-E, S-E
IATA Code	UN1263	PAINT	3 -	III	No.	-

Code : Classification
PG* : Packing group
Env.* : Environmental hazards

14.6 Special precautions for user

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Federal regulations : All components are listed or exempted.

TSCA 8(a) PAIR: n-butyl methacrylate
TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

Clean Water Act (CWA) 307: ethylbenzene

Clean Water Act (CWA) 311: xylene; ethylbenzene; methyl methacrylate; styrene; n-butyl acetate; formaldehyde

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SECTION 15: Regulatory information

SARA 302/304 - SARA 311/312:

SARA 302/304: formaldehyde
SARA 311/312 Hazards identification: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

Product/ingredient name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
solvent naphtha (petroleum), light arom.	10 - 25	Yes.	No.	No.	Yes.	No.
n-butyl acetate	5 - 10	Yes.	No.	No.	Yes.	No.
xylene	3 - 5	Yes.	No.	No.	Yes.	No.
1,2,4-trimethylbenzene	3 - 5	Yes.	No.	No.	Yes.	No.
1,3-bis(12-hydroxyocta-decanamide-N-methyle)benzene	0.5 - 1	No.	No.	No.	Yes.	No.
bis (1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	0.1 - 0.5	No.	No.	No.	Yes.	No.

SARA 313 :

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

Form R - Reporting requirements :

Product/ingredient name	CAS number	Concentration
xylene	1330-20-7	3 - 5
1,2,4-trimethylbenzene	95-63-6	3 - 5
ethylbenzene	100-41-4	0 - 1

Supplier notification :

Product/ingredient name	CAS number	Concentration
xylene	1330-20-7	3 - 5
1,2,4-trimethylbenzene	95-63-6	3 - 5
ethylbenzene	100-41-4	0 - 1

State regulations :

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: The following components are listed: XYLENE; BUTYL ACETATE; TRIMETHYL BENZENE; PSEUDOCUMENE; CALCIUM CARBONATE; BARIUM SULFATE; TITANIUM DIOXIDE
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: The following components are listed: XYLENES; BENZENE, DIMETHYL-; n-BUTYL ACETATE; ACETIC ACID, BUTYL ESTER; TRIMETHYL BENZENE (mixed isomers); BENZENE, TRIMETHYL-; CUMENE; BENZENE, (1-METHYLETHYL)-; PSEUDOCUMENE; 1,2,4-TRIMETHYL BENZENE; CALCIUM CARBONATE; LIMESTONE; BARIUM SULFATE; SULFURIC ACID, BARIUM SALT (1:1); TITANIUM DIOXIDE; TITANIUM OXIDE (TiO2)
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: The following components are listed: Xylene (mixed); Butyl acetate; Cumene; Benzene, 1-methylethyl-
New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: The following components are listed: BENZENE, DIMETHYL-; ACETIC ACID, BUTYL ESTER; BENZENE, TRIMETHYL-; BENZENE, (1-METHYLETHYL)-; PSEUDOCUMENE; LIMESTONE; BARIUM SULFATE; TITANIUM OXIDE (TIO2)
Rhode Island Hazardous Substances: None of the components are listed.

California Prop. 65 PFF :

WARNING: This product contains a chemical known to the State of California to cause cancer.
WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

SECTION 15: Regulatory information

Product/ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
titanium dioxide	Yes.	No.	No.	No.
ethylbenzene	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
respirable quartz	Yes.	No.	No.	No.
1-ethyl-2-methylbenzene	No.	Yes.	No.	No.
Cumen	Yes.	No.	No.	No.
carbonblack	Yes.	No.	No.	No.
formaldehyde	Yes.	No.	Yes.	No.

SECTION 16: Other information

Remarks : Note: In USA, consult Code of Federal Regulations, Title 29, Labor, Parts 1910 and 1915 concerning occupational safety and health standards and regulations, as well as any other applicable Federal, State or local regulations that apply to safe practices in coating operations.
Warning! If you scrape, sand, or remove old paint, you may release lead dust. LEAD is TOXIC.

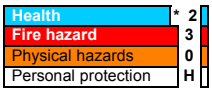
Validation : Validated by Company on 3/10/2015.

GHS Classification

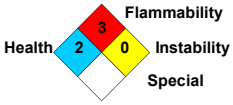
Procedure used to derive the classification.

Classification	Justification
FLAMMABLE LIQUIDS - Category 3	On basis of test data
SKIN CORROSION/IRRITATION - Category 2	Calculation method
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A	Calculation method
SKIN SENSITIZATION - Category 1	Calculation method

Hazardous Material Information System (U.S.A.)



National Fire Protection Association (U.S.A.)



Personal Protective Equipment (PPE) shown in this section is a suggestion. Since conditions vary from one work location to another consult the facility safety & health program. Customer or end user is responsible to evaluate worker exposure conditions at the site of application and determine the appropriate PPE suitable for workers at that particular facility or location.

Abbreviations and acronyms :

ANSI = American National Standards Institute
HCS = Hazardous Communication System
TSCA = Toxic Substances Control Act
CFR = Code of federal Regulations
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
OSHA = United States Occupational Health and Safety Administration
NIOSH = National Institute for Occupational Safety and Health
ACGIH = American Conference of Industrial Hygienists
IARC = International Agency for Research on Cancer.
NTP = National Toxicology Program
ATE = Acute Toxicity Estimate

OECD = Organisation for Economic Co-operation and Development
BCF = Bioconcentration Factor
DOT = United States Department of Transportation
ERG = Emergency Response Guide
TDG = Transport of Dangerous Goods, Canada
SCT = Transportation & Communications Ministry, Mexico
IMDG = International Maritime Dangerous Goods
IATA = International Air Transport Association
SARA = Superfund Amendments Reauthorization Act
EPCRA = Emergency Planning and Community Right to Know Act

Notice to reader

Indicates information that has changed from previously issued version.

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

HEMPEL'S ZINC PRIMER 16490

Protective Clothing	General Hazard	DOT

Conforms to ANSI Z400.1-2010 Standard - HCS 2012

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : HEMPEL'S ZINC PRIMER 16490

Product identity : 1649019840

Product type : zinc phenoxy primer

1.2 Relevant identified uses of the substance or mixture and uses advised against

Field of application : metal industry, ships and shipyards.

Identified uses : Industrial/Professional use

TSCA : **Unless otherwise stated All components are listed or exempted.**

1.3 Details of the supplier of the safety data sheet

Company details :

HEMPEL (USA), Inc.
600 Conroe Park North Drive
Conroe, Texas 77303
Toll free: (800) 678-6641,
if outside area codes 713, 281, 409, 936
Regular phone number: (936) 523-6000
E-mail Hempel@Hempel.com

1.4 Emergency telephone number (with hours of operation)

For Transportation Emergencies : (24 hours)

CHEMTREC: **1-800-424-9300** (Toll-free in the U.S., Canada and the U.S. Virgin Islands) **703-527-3887**
For calls originating elsewhere (Collect calls are accepted). Contract number: CCN10384
To preserve the effectiveness of arrangements for providing accurate and timely emergency response information, the basic identifying information (shipper name or contract number) must be included on shipping papers.
If the purchaser of this product is going to be shipping this product to other locations, the purchaser must arrange for its own Emergency Information Provider to respond to transport incidents. Hempel's 24 hour response contract does not cover non-Hempel shipments.

For all other information : (8 AM - 5 PM CST)

In USA toll free calling available: 1-800- 678-6641 or (936)-523-6000
See Section 4 of the safety data sheet (first aid measures).

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910. 1200).

GHS Classification :

FLAMMABLE LIQUIDS - Category 2
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

2.2 Label elements

SECTION 2: Hazards identification

Hazard pictograms :

Signal word : Danger

Hazard statements :
H225 - Highly flammable liquid and vapor.
H319 - Causes serious eye irritation.
H315 - Causes skin irritation.
H373 - May cause damage to organs through prolonged or repeated exposure.

Precautionary statements :

Prevention : Wear protective gloves. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Do not breathe vapor. Wash hands thoroughly after handling.

Response : Get medical attention if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : None known.

2.3 Other hazards

Hazards not otherwise classified : None known.

SECTION 3: Composition/information on ingredients

Product definition : Mixture

Physical state : Liquid.

Product/ingredient name	Identifiers	%	GHS Classification
xylene	1330-20-7	12.5 - 15	FLAMMABLE LIQUIDS - Category 3 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 SKIN CORROSION/IRRITATION - Category 2
butanone	78-93-3	10 - 12.5	FLAMMABLE LIQUIDS - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3
ethylbenzene	100-41-4	1 - 3	FLAMMABLE LIQUIDS - Category 2 ACUTE TOXICITY (inhalation) - Category 4 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (ears) - Category 2 ASPIRATION HAZARD - Category 1
isopropanol	67-63-0	1 - 3	FLAMMABLE LIQUIDS - Category 2 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Occupational exposure limits, if available, are listed in Section 8.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

SECTION 4: First aid measures

4.1 Description of first aid measures

General :	In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person. If breathing is irregular, drowsiness, loss of consciousness or cramps: Call 911 and give immediate treatment (first aid).
Eye contact :	Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. In all cases of doubt, or when symptoms persist, seek medical attention.
Inhalation :	Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Give nothing by mouth. If unconscious, place in recovery position and get medical attention immediately.
Skin contact :	Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.
Ingestion :	If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do not induce vomiting unless directed to do so by medical personnel. Lower the head so that vomit will not re-enter the mouth and throat.
Protection of first-aiders :	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact :	Causes serious eye irritation.
Inhalation :	No known significant effects or critical hazards.
Skin contact :	Causes skin irritation.
Ingestion :	Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact :	Adverse symptoms may include the following: pain or irritation watering redness
Inhalation :	No specific data.
Skin contact :	Adverse symptoms may include the following: irritation redness
Ingestion :	No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician :	Not applicable.
Specific treatments :	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Extinguishing media :	Recommended: Approved Class D extinguisher or smother with dry sand, dry clay or dry ground limestone. NOT TO BE USED: WATER. Risk of formation of very flammable and explosive vapours.

5.2 Special hazards arising from the substance or mixture

SECTION 5: Firefighting measures

Hazards from the substance or mixture :	Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous combustion products :	Decomposition products may include the following materials: carbon oxides metal oxide/oxides

5.3 Advice for firefighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard. Cool closed containers exposed to fire with water. Do not release runoff from fire to drains or watercourses. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid all direct contact with the spilled material. Do not use water. Violent reaction may occur. Exclude sources of ignition and be aware of explosion hazard. Ventilate the area. Avoid breathing vapor or mist. Refer to protective measures listed in sections 7 and 8. No action shall be taken involving any personal risk or without suitable training. If the product contaminates lakes, rivers, or sewers, inform the appropriate authorities in accordance with local regulations.

6.2 Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and materials for containment and cleaning up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilled product.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Vapors are heavier than air and may spread along floors. Vapors may form explosive mixtures with air. Prevent the creation of flammable or explosive concentrations of vapors in air and avoid vapor concentrations higher than the occupational exposure limits. In addition, the product should be used only in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard. To dissipate static electricity during transfer, ground drum and connect to receiving container with bonding strap. No sparking tools should be used. Open with care, danger of overpressure.
Avoid inhalation of vapour, dust and spray mist. Avoid contact with skin and eyes. Eating, drinking and smoking should be prohibited in area where this material is handled, stored and processed. Appropriate personal protective equipment: see Section 8. Always keep in containers made from the same material as the original one.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations for flammable liquids. Store in a cool, well-ventilated area away from incompatible materials and ignition sources. Keep out of the reach of children. Keep away from: Oxidizing agents, strong alkalis, strong acids as well as of amines, alcohols and water. No smoking. Prevent unauthorized access. Containers that are opened must be carefully resealed and kept upright to prevent leakage.

SECTION 7: Handling and storage

7.3 Specific end use(s)

See separate Product Data Sheet for recommendations or industrial sector specific solutions.
This product may be applied using several application techniques and methods of handling may be different for each. Application techniques include [but are not limited to] brushing, rolling, and spray application [conventional, HPLV, airless, pleural component or aerosol can]. Avoid the breathing of vapors and, if spraying, do not breath spray mist or aerosols.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Product/ingredient name	Exposure limit values
xylene	**ACGIH TLV (United States, 4/2014).** STEL: 651 mg/m³ 15 minutes. STEL: 150 ppm 15 minutes. TWA: 434 mg/m³ 8 hours. TWA: 100 ppm 8 hours. **OSHA PEL (United States, 2/2013).** TWA: 435 mg/m³ 8 hours. TWA: 100 ppm 8 hours.
butanone	**ACGIH TLV (United States, 4/2014).** STEL: 885 mg/m³ 15 minutes. STEL: 300 ppm 15 minutes. TWA: 590 mg/m³ 8 hours. TWA: 200 ppm 8 hours. **NIOSH REL (United States, 10/2013).** STEL: 885 mg/m³ 15 minutes. STEL: 300 ppm 15 minutes. TWA: 590 mg/m³ 10 hours. TWA: 200 ppm 10 hours. **OSHA PEL (United States, 2/2013).** TWA: 590 mg/m³ 8 hours. TWA: 200 ppm 8 hours.
ethylbenzene	**ACGIH TLV (United States, 4/2014).** TWA: 20 ppm 8 hours. **NIOSH REL (United States, 10/2013).** STEL: 545 mg/m³ 15 minutes. STEL: 125 ppm 15 minutes. TWA: 435 mg/m³ 10 hours. TWA: 100 ppm 10 hours. **OSHA PEL (United States, 2/2013).** TWA: 435 mg/m³ 8 hours. TWA: 100 ppm 8 hours.
isopropanol	**ACGIH TLV (United States, 6/2013).** STEL: 400 ppm 15 minutes. TWA: 200 ppm 8 hours. **NIOSH REL (United States, 4/2013).** STEL: 1225 mg/m³ 15 minutes. STEL: 500 ppm 15 minutes. TWA: 980 mg/m³ 10 hours. TWA: 400 ppm 10 hours. **OSHA PEL (United States, 2/2013).** TWA: 980 mg/m³ 8 hours. TWA: 400 ppm 8 hours.

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

8.2 Exposure controls

Appropriate engineering controls

SECTION 8: Exposure controls/personal protection

Provide local exhaust and general ventilation systems to maintain airborne concentrations below OSHA, ACGIH, and manufacturer recommended exposure limits. Local exhaust ventilation is preferred because it prevents contaminant dispersion into work areas by controlling it at its source. Use local and general exhaust ventilation to effectively remove and prevent buildup of mists/vapors/fumes generated from the handling of this product.
Note: Local exhaust ventilation is designed to capture an emitted contaminant at or near its source, before the contaminant has a chance to disperse into the workplace air. General exhaust ventilation, also called dilution ventilation, is different from local exhaust ventilation because instead of capturing emissions at their source and removing them from the air, general exhaust ventilation allows the contaminant to be emitted into the workplace air and then dilutes the concentration of the contaminant to an acceptable level (e.g., to the PEL or below).

Individual protection measures

General :	Gloves must be worn for all work that may result in soiling. Apron/coveralls/protective clothing must be worn when soiling is so great that regular work clothes do not adequately protect skin against contact with the product. Safety eyewear should be used when there is a likelihood of exposure.
Hygiene measures :	Wash hands, forearms, and face thoroughly after handling compounds and before eating, smoking, using lavatory, and at the end of day.
Eye/face protection :	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
Hand protection :	Wear chemical-resistant gloves in combination with 'basic' employee training. The quality of the chemical-resistant protective gloves must be chosen as a function of the specific workplace concentrations and quantity of hazardous substances. Since the actual work situation is unknown. Supplier of gloves should be contacted in order to find the appropriate type. Below listed glove(s) should be regarded as generic advice: May be used: nitrile rubber, butyl rubber Not recommended: neoprene rubber, polyvinyl chloride (PVC), natural rubber (latex) Recommended: Silver Shield / 4H gloves, Viton®, polyvinyl alcohol (PVA)
Body protection :	Personal protective equipment for the body should be selected based on the task being performed and the risks involved handling this product. Wear suitable protective clothing. Always wear protective clothing when spraying.
Respiratory protection :	If working areas have insufficient ventilation, wear half or totally covering mask equipped with gas filter of type Organic Vapor, when grinding use particle filter of type P95, P99 or P100. When spraying use a combined filter (organic vapor / HEPA or organic vapor / P100 type). Be sure to use approved/certified respirator or equivalent. Always wear an air-fed respirator when spraying in a continuous and prolonged work situation (e.g. hood with supply of fresh or compressed air or a full face, powered air purifying filter). **This product contains low-boiling point liquids. Any respiratory protective equipment should be air-fed.**
Protective clothing (pictograms) :	 Note: Application of paint products by spraying requires additional safety precautions: Full body suit, Full face respirator with air supplied.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state :	Liquid.
Odor :	Solvent-like
pH :	Testing not relevant or not possible due to nature of the product.
Melting point/freezing point :	419.85°C This is based on data for the following ingredient: Zinc
Boiling point/boiling range :	Testing not relevant or not possible due to nature of the product.
Flash point :	Closed cup: 7°C (44.6°F)
Evaporation rate :	Testing not relevant or not possible due to nature of the product.
Flammability :	Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge. Highly flammable in the presence of the following materials or conditions: heat and oxidizing materials.
Upper/lower flammability or explosive limits :	0.8 - 12 vol %
Vapor pressure :	Testing not relevant or not possible due to nature of the product.
Vapor density :	Testing not relevant or not possible due to nature of the product.
Relative density :	1.684 g/cm³
Solubility(ies) :	Easily soluble in the following materials: cold water and hot water.
Partition coefficient (LogKow) :	Testing not relevant or not possible due to nature of the product.
Auto-ignition temperature :	Testing not relevant or not possible due to nature of the product.
Decomposition temperature :	Testing not relevant or not possible due to nature of the product.
Viscosity :	Testing not relevant or not possible due to nature of the product.
Explosive properties :	Highly explosive in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. Slightly explosive in the presence of the following materials or conditions: moisture.
Oxidizing properties :	Testing not relevant or not possible due to nature of the product.

9.2 Other information

Solvent(s) % by weight (Included exempt solvent(s)):	34.1 % (w/w)
Water % by weight :	Weighted average: 0 %
VOC content (Coatings) :	4.79 lbs/gal (573.9 g/l)
VOC content (Regulatory) :	4.79 lbs/gal (573.9 g/l)
TOC Content (Volatile) :	Weighted average: 435 g/l
Solvent Gas :	Weighted average: 0.153 m³/l

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability

The product is stable.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid

SECTION 10: Stability and reactivity

Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials

Highly reactive or incompatible with the following materials: oxidizing materials and acids.
Reactive or incompatible with the following materials: reducing materials, organic materials, alkalis and moisture.

10.6 Hazardous decomposition products

When exposed to high temperatures (i.e. in case of fire) harmful decomposition products may be formed:

Decomposition products may include the following materials: carbon oxides metal oxide/oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Exposure to component solvent vapor concentrations may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Solvents may cause some of the above effects by absorption through the skin. Symptoms and signs include headaches, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, loss of consciousness. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin. If splashed in the eyes, the liquid may cause irritation and reversible damage. Accidental swallowing may cause stomach pain. Chemical lung inflammation may occur if the product is taken into the lungs via vomiting.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
xylene	LC50 Inhalation Gas.	Rat	5000 ppm	4 hours
	LC50 Inhalation Vapor	Rat	6350 ppm	4 hours
	LD50 Oral	Rat	4300 mg/kg	-
butanone	LD50 Dermal	Rabbit	6480 mg/kg	-
ethylbenzene	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	3500 mg/kg	-
isopropanol	LD50 Dermal	Rabbit	12800 mg/kg	-
	LD50 Intraperitoneal	Rabbit	667 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
	LDLo Oral	Human	3570 mg/kg	-

Acute toxicity estimates

Route	ATE value
Oral	33149.5 mg/kg
Dermal	11950.5 mg/kg
Inhalation (gases)	43669.3 ppm
Inhalation (vapors)	97.99 mg/l

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure
xylene	Eyes - Severe irritant	Rabbit	-	24 hours 5 milligrams
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams
butanone	Skin - Mild irritant	Rabbit	-	24 hours 402 milligrams
ethylbenzene	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams
	Respiratory - Mild irritant	Rabbit	-	-
	Eyes - Mild irritant	Rabbit	-	-
isopropanol	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams
	Skin - Mild irritant	Rabbit	-	500 milligrams

Carcinogen Classification

Product/ingredient name	IARC	NTP	OSHA
xylene	3	-	-
ethylbenzene	2B	-	-
isopropanol	3	-	-

SECTION 11: Toxicological information

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
butanone	Category 3	Not applicable.	Narcotic effects
isopropanol	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
ethylbenzene	Category 2	Not determined	ears

Aspiration hazard

Product/ingredient name	Result
ethylbenzene	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure

Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential chronic health effects

Other information : No additional known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Do not allow to enter drains or watercourses. Very toxic to aquatic life with long lasting effects.

When spilled, this product may act as an oil, causing a film, sheen, emulsion, or sludge at or beneath the surface of a body of water. Oils of any kind can cause: (a) drowning of waterfowl due to lack of buoyancy, loss of insulating capacity of feathers, starvation and vulnerability to predators due to lack of mobility; (b) lethal effect on fish by coating gill surfaces, preventing respiration; (c) potential fish kills resulting from alteration in biochemical oxygen demand; (d) asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom; and (e) adverse aesthetic effects of fouled shoreline and beaches.

Product/ingredient name	Result	Species	Exposure
ethylbenzene	Chronic NOEC <1000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
xylene	-	>60 % - Readily - 28 days	-	-
butanone	-	98 % - Readily - 28 days	-	-
ethylbenzene	-	>70 % - Readily - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
xylene	-	-	Readily
butanone	-	-	Readily
ethylbenzene	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
xylene	3.12	8.1 - 25.9	low
butanone	0.3	<100	low
ethylbenzene	3.6	-	low
isopropanol	0.05	-	low

12.4 Mobility in soil

SECTION 12: Ecological information

Soil/water partition coefficient (K_{OC}) : No known data avaliable in our database.

Mobility : No known data avaliable in our database.

12.5 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.
The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.
Refer to Section 7 and Section 8 for additional handling information and protection of employees.

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Xylene	1330-20-7	Listed	U239
Methyl ethyl ketone (MEK) (I,T); 2-Butanone (I,T)	78-93-3	Listed	U159

SECTION 14: Transport information

Transport may take place according to national regulation or DOT for transport by road and by train, IMDG for transport by sea, IATA for Air shipment. Refer to specific Dangerous Goods Transport requirements under 49CFR, ICAO and IATA.

	14.1 UN no.	14.2 Proper shipping name	14.3 Transport hazard class(es)	14.4 PG*	14.5 Env*	Additional information
DOT Code	UN1263	PAINT. (Zinc)	3 -	II	Yes.	**ERG : 128** The marine pollutant mark is not required when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes. **Reportable quantity** (xylene, Zinc) 763.35 lbs / 346.56 kg [54.365 gal / 205.8 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
TDG Code	UN1263	PAINT. (Zinc)	3 -	II	Yes.	The marine pollutant mark is not required when transported by road or rail.

SECTION 14: Transport information

SCT Code	UN1263	PAINT	3 -		II	No.	-
IMDG Code	UN1263	PAINT. (Zinc)	3 -		II	Yes.	The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg. **Emergency schedules (EmS)** F-E, S-E
IATA Code	UN1263	PAINT	3 -		II	No.	The environmentally hazardous substance mark may appear if required by other transportation regulations.

Code : Classification
PG* : Packing group
Env.* : Environmental hazards

14.6 Special precautions for user

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Federal regulations : All components are listed or exempted.

TSCA 8(a) PAIR: 2-methoxy-1-methylethyl acetate
TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

Clean Water Act (CWA) 307: Zinc; zinc powder - zinc dust (stabilized); zinc oxide; ethylbenzene; dibenzyl phthalate; butylbenzylphthalate

Clean Water Act (CWA) 311: xylene; ethylbenzene; epichlorohydrin

Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Listed

SARA 302/304 - SARA 311/312:

SARA 302/304: epichlorohydrin
SARA 311/312 Hazards identification: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

Product/ingredient name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
xylene	10 - 25	Yes.	No.	No.	Yes.	No.
butanone	10 - 25	Yes.	No.	No.	Yes.	No.
ethylbenzene	1 - 3	Yes.	No.	No.	Yes.	Yes.
isopropanol	1 - 3	Yes.	No.	No.	Yes.	No.

SARA 313 :

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

SECTION 15: Regulatory information

Form R - Reporting requirements :

Product/ingredient name	CAS number	Concentration
Zinc	Sec. (7440-66-6)	20 - 50
zinc powder - zinc dust (stabilized)	7440-66-6	20 - 50
xylene	1330-20-7	10 - 20
butanone	78-93-3	10 - 20
ethylbenzene	100-41-4	1 - 3
zinc oxide	1314-13-2	1 - 3
isopropanol	67-63-0	1 - 3

Supplier notification :

Product/ingredient name	CAS number	Concentration
zinc powder - zinc dust (stabilized)	7440-66-6	20 - 50
xylene	1330-20-7	10 - 20
butanone	78-93-3	10 - 20
ethylbenzene	100-41-4	1 - 3
zinc oxide	1314-13-2	1 - 3
isopropanol	67-63-0	1 - 3

State regulations :

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: The following components are listed: ZINC; ZINC OXIDE FUME; XYLENE; ETHYL BENZENE; METHYL ETHYL KETONE (MEK); CALCIUM CARBONATE; ISOPROPYL ALCOHOL
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: The following components are listed: ZINC; ZINC OXIDE; XYLENES; BENZENE, DIMETHYL-; ETHYL BENZENE; BENZENE, ETHYL-; METHYL ETHYL KETONE; 2-BUTANONE; CALCIUM CARBONATE; LIMESTONE; ISOPROPYL ALCOHOL; 2-PROPANOL
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: The following components are listed: Zinc; Xylene (mixed); Ethylbenzene; Methyl ethyl ketone; 2-Butanone
New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: The following components are listed: ZINC; ZINC OXIDE (ZNO); BENZENE, DIMETHYL-; BENZENE, ETHYL-; 2-BUTANONE; LIMESTONE; 2-PROPANOL
Rhode Island Hazardous Substances: None of the components are listed.

California Prop. 65 PFF :

WARNING: This product contains a chemical known to the State of California to cause cancer.
WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

Product/ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
ethylbenzene	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
cadmium	Yes.	Yes.	0.05 µg/day (inhalation)	Yes.
respirable quartz	Yes.	No.	No.	No.
butylbenzylphthalate	No.	Yes.	No.	1200 µg/day (ingestion)
epichlorohydrin	Yes.	Yes.	Yes.	No.

SECTION 16: Other information

Remarks : Note: In USA, consult Code of Federal Regulations, Title 29, Labor, Parts 1910 and 1915 concerning occupational safety and health standards and regulations, as well as any other applicable Federal, State or local regulations that apply to safe practices in coating operations.
Warning! If you scrape, sand, or remove old paint, you may release lead dust. LEAD is TOXIC.

Validation : Validated by US - HSE Products Coordinator on 3/10/2015.

GHS Classification

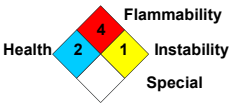
Procedure used to derive the classification.

SECTION 16: Other information

Classification	Justification
FLAMMABLE LIQUIDS - Category 2	On basis of test data
SKIN CORROSION/IRRITATION - Category 2	Calculation method
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2	Calculation method

Hazardous Material Information System (U.S.A.)

National Fire Protection Association (U.S.A.)



Personal Protective Equipment (PPE) shown in this section is a suggestion. Since conditions vary from one work location to another consult the facility safety & health program. Customer or end user is responsible to evaluate worker exposure conditions at the site of application and determine the appropriate PPE suitable for workers at that particular facility or location.

Abbreviations and acronyms :

ANSI = American National Standards Institute
HCS = Hazardous Communication System
TSCA = Toxic Substances Control Act
CFR = Code of federal Regulations
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
OSHA = United States Occupational Health and Safety Administration
NIOSH = National Institute for Occupational Safety and Health
ACGIH = American Conference of Industrial Hygienists
IARC = International Agency for Research on Cancer.
NTP = National Toxicology Program
ATE = Acute Toxicity Estimate

OECD = Organisation for Economic Co-operation and Development
BCF = Bioconcentration Factor
DOT = United States Department of Transportation
ERG = Emergency Response Guide
TDG = Transport of Dangerous Goods, Canada
SCT = Transportation & Communications Ministry, Mexico
IMDG = International Maritime Dangerous Goods
IATA = International Air Transport Association
SARA = Superfund Amendments Reauthorization Act
EPCRA = Emergency Planning and Community Right to Know Act

Notice to reader

Indicates information that has changed from previously issued version.

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Safety Data Sheet

Section 1: PRODUCT AND COMPANY IDENTIFICATION

SDS Identification Name: HexPly® M9.1 Prepreg
SDS Number: 439-7737-HPLY-M9.1-04 **Date:** November 1, 2011 **Page:** 1 of 7
Supersedes SDS Number: 242-2628-M9.1-PPUS-03
US43104

Manufacturer:
Hexcel®
31815 Great Western Drive
Windsor, CO. 80550

Emergency Telephone Number:
800-433-5072 (24-Hour) Hexcel®

Information Telephone Number:
925-551-4900 (Normal Business Hours-PT)

Product Identification Number: HexPly® M9.1 Prepreg

Chemical Family: Formulated Epoxy Resin Impregnated Material: Carbon, Fiberglass or Peel Ply

Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

The listed components are classified as Hazardous Chemicals as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Component	CAS® Number	% by Weight	OSHA (PEL)	ACGIH® (TLV®)
Resin Matrix Information:				
Epichlorohydrin/ Bisphenol A epoxy resin	25068-38-6	27-56	Not determined	Not determined
Diuron	330-54-1	0.5-2	10 mg/m^3	10 mg/m^3
Substrate Information, as appropriate, for various product types:				
Fiberglass fiber, synthetic, vitreous, continuous filament	65997-17-3	40-70	15 mg/m^3 (Total) 5 mg/m^3 (Respirable)	5 mg/m^3 (Inhalable) 1 f/cc (Respirable)

This product is classified as a Hazardous Chemical as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

The percentages will vary depending on product type, which fiber or fabric is used, the individual component's variation and the resin content applied.

The exposure limits expressed are for each individual component and not for the total product.

Where specific exposure limits for component dusts are not established, the levels provided for (Total/Inhalable) dust and (Respirable) fraction reflect the classification of Particulate Not Otherwise Regulated (PNOR) by OSHA or Classified (PNOC) by ACGIH®.

Section 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance and Odor:
Resin impregnated fiber, fabric or peel ply with no distinctive odor.

Statements of Hazard:
Warning! Dust generated from machining, grinding or sanding the cured product may be combustible and could result in fire and/or explosion should the necessary dust concentration in air and ignition source be present.

Warning! This may cause eye and skin irritation, allergic skin reaction and sensitization.

Vapor or fumes generated from heating or curing this product may cause eye and respiratory tract irritation.

Dust from machining, grinding or sawing the cured product may cause skin, eye and upper respiratory tract irritation, allergic skin reaction and possible sensitization.

Primary Routes of Exposure:

Eye--Yes	Skin--Yes	Inhalation--Yes	Ingestion--No

HMIS® Rating:

Health--2* Chronic	Flammability--0	Reactivity--1	Special--None

Potential Health Effects:

Eye: Contact may cause irritation. Vapor or fumes generated from exposing this product to elevated temperatures may cause irritation. Dust from machining, grinding or sawing the cured product may cause mechanical irritation.

Skin: Contact may cause irritation, allergic skin reaction, dermatitis and possible sensitization. Dust from machining, grinding or sawing the cured product may cause mechanical irritation.

Inhalation: May cause irritation to the upper respiratory tract. Vapor or fumes generated from exposing this product to elevated temperatures may cause irritation to the respiratory tract. Dust from machining, grinding or sawing the cured product may cause irritation to the upper respiratory tract.

Ingestion: None expected under normal conditions of use. If any of this product or the cured product dust is swallowed, seek medical attention.

Medical Conditions Aggravated by Exposure: Preexisting eye, skin or respiratory disorders may be aggravated by exposure to this product or to the dust from machining, grinding or sawing the cured product.

Carcinogenic Information: The components present in this material at concentrations equal to or greater than 0.1 % are not listed or regulated by IARC, NTP, OSHA or ACGIH® as a carcinogen. Except for Diuron (CAS® # 330-54-1), which is an ACGIH® Class A4, not classifiable as a human carcinogen.

Other:	**OSHA (PEL)**	**ACGIH® (TLV®)**
Exposure Limits for cured product dust as [Particulate Not Otherwise Regulated (PNOR) by OSHA or Classified (PNOC) by ACGIH®]:	15 mg/m^3 (Total) 5 mg/m^3 (Respirable)	10 mg/m^3 (Inhalable) 3 mg/m^3 (Respirable)

Section 4: FIRST AID MEASURES

Eye: In case of eye contact, immediately flush eyes with large amounts of water for at least 15 minutes, keeping the eyelids open. Get medical attention immediately.

Skin: In case of contact with this product or the cured product dust, immediately wash skin with soap and plenty of water. Get medical attention if irritation develops.

Inhalation: If excessive inhalation of vapor or fumes occurs, remove to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, qualified personnel may administer oxygen. If dust is inhaled in a large quantity, remove to fresh air. Get medical attention immediately.

Ingestion: Ingestion of this product or the dust from it is unlikely. If swallowed, get medical attention immediately.

Section 5: FIRE FIGHTING MEASURES

Flash Point/Method of Determination: Not determined

Means of Extinction: Use water spray, dry chemical or CO_2 to extinguish fires.

Special Fire Hazards: Avoid exposure through use of a self-contained, positive-pressure breathing apparatus. Dust generated from machining, grinding or sanding the product may be combustible and could result in fire and/or explosion should the necessary dust concentration in air and ignition source be present.

Section 6: ACCIDENTAL RELEASE MEASURES

Procedures in case of Accidental Release or Leakage: Avoid contact with skin, eyes or clothing (See Section 8). Clean up material and put into a suitable container and dispose of properly (See Section 13).

Section 7: HANDLING AND STORAGE

Precautions to be taken in Handling and Storage: See label on container for the proper temperature. Maintain sealed against contamination from dirt and moisture.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye/Face Protection: Avoid eye contact. Wear safety glasses with side shields when machining, grinding or sawing the cured product.

Skin Protection: Use gloves made of impervious materials. Wear clothing sufficient to cover skin areas.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION (Continued)

Respiratory Protection: Not ordinarily required. If sufficient vapor or fumes are being generated during heating or curing of this product, use a NIOSH approved organic vapor respirator. If sufficient dust is generated during machining, grinding or sawing the cured product, use a NIOSH approved dust respirator.

Ventilation: Use local exhaust sufficient to control vapor, fumes or dust generated. If an exhaust ventilation is not available or is inadequate, use a NIOSH approved respirator, as appropriate.

General Hygiene Recommendations: Before eating, drinking, smoking or using toilet facilities, wash face and hands thoroughly with soap and water. Use vacuum equipment to remove the cured product dust from clothing and work areas. Compressed air is not recommended.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor.....	Resin impregnated fiber, fabric or peel ply with no distinctive odor.
Melting Point (^{o}F/^{o}C).....	Not determined
Specific Gravity (Water=1).....	Not determined
pH of Undiluted Product.....	Not determined
Vapor Pressure (mm Hg.).....	Not determined
Vapor Density (Air=1).....	Not determined
Viscosity.....	Not determined
Percent (%) VOC.....	Same as % Volatile
Volatile [Percent (%) by Weight]....	0%
Solubility in Water.....	Not determined

Section 10: STABILITY AND REACTIVITY

Stability: Stable under proper handling conditions.

Incompatible Materials: Avoid strong acids, bases, oxidizers and amines.

Products evolved from Heat of Combustion or Decomposition: The products of combustion and decomposition depend on other materials present in the fire and the actual conditions of the fire. Burning will produce carbon oxides, nitrogen, aldehydes, phenolics, water, ammonia, melamine, dimethylamine, 2,4-dichlorophenyl isocyanate, chlorine and other unidentified gases and vapors that may be toxic. Avoid inhalation.

Hazardous Polymerization: Will not occur under proper conditions of use. Rapid heating of the product in bulk may produce an uncontrolled exothermic reaction that may char and decompose the resin system, generating unidentified gases and vapors that may be toxic. Avoid inhalation.

Section 11: TOXICOLOGICAL INFORMATION

Component Toxicity Data:
Median Lethal Dose (Species):
Oral (LD_{50})...Epichlorohydrin/Bisphenol A epoxy resin…>5,000 mg/kg (Rat)
…Diuron…>1,017 mg/kg (Rat)

Dermal (LD_{50})...Epichlorohydrin/Bisphenol A epoxy resin...>20,000 mg/kg (Rabbit)
…Diuron…>2,000 mg/kg (Rabbit)

Inhalation (LC_{50})...Diuron…>5.0 mg/L/4H (Rat)

Irritation Index, Estimation of Irritation (Species):
Skin...Not determined
Eye...Not determined
Inhalation (LC_{50})...Not determined

Other:
Sensitization…Epichlorohydrin/Bisphenol A epoxy resin…Sensitizer (Guinea pig)

Mutagenic:
Epichlorohydrin/Bisphenol A epoxy resin...Hamster Bone Marrow Cytogenetics (In-Vivo)-Negative
…Mouse Spermatocytes Cytogenetics (In-Vivo)-Negative
…Micronucleus Test (In Vivo)-Negative
…Mouse Dominant Lethal Test-Negative
…Alkylation of DNA-Positive
…Human Mononucleated WBC (In-Vitro)-Negative
…Host Mediated Assay-Negative

Section 12: ECOLOGICAL INFORMATION

No ecological data has been determined.

Section 13: DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Material for disposal should be placed in appropriate sealed containers to avoid potential human and environmental exposure. It is the responsibility of the generator to comply with all federal, state, provincial and local laws and regulations. We recommend that you contact an appropriate waste disposal contractor and environmental agency for relevant laws and regulations. Under the U.S., Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.

Section 14: TRANSPORT INFORMATION

DOT:

Proper Shipping Name….	Not regulated
Hazard Class.....	Not regulated
Identification Number…..	Not regulated
Packing Group…….……	Not regulated
Label Required..……..	None

Section 15: REGULATORY INFORMATION

SARA Title III:
Section 302/304 Extremely Hazardous Substance:
None

Section 311 Hazardous Categorization:
Class 1 (Acute)
Class 2 (Chronic)

Section 313 Toxic Chemicals:
Diuron (CAS® # 330-54-1)

CERCLA Section 102(a) Hazardous Substance:
Diuron (CAS® # 330-54-1), RQ 100

RCRA Information: Currently, this product is not listed in federal hazardous waste regulations 40 CFR, Part 261.33, paragraphs (e) or (f), i.e. chemical products that are considered hazardous if they become wastes. State or local hazardous waste regulations may also apply if they are different from the federal regulation. It is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.

WHMIS (Canada):
Classification:
D2B

This product has been classified in accordance with hazard criteria of the "Controlled Products Regulations" and this SDS contains all the information required by the "Controlled Products Regulations."

Ingredient Disclosure List:
Epichlorohydrin/Bisphenol A epoxy resin (CAS® # 25068-38-6)
Diuron (CAS® # 330-54-1)

TSCA Information: This product is an article as defined by TSCA and is not required to be listed in the TSCA inventory.

Ozone Depletion Information: This product does not contain or is not manufactured with ozone depleting substances as identified in Title VI, Clean Air Act "Stratospheric Ozone Protection" and the regulations set forth in 40 CFR, Part 82.

Section 16: OTHER INFORMATION

Special Precautions: When present in the product, airborne carbon fibers or dust may create electrical short-circuits which could result in damage to or malfunctioning of electrical equipment.

Explanation and Disclaimer: Wherever such words or phrases as "hazardous," "toxic," "carcinogen," etc. appear herein, they are used as defined or described under state employee right-to-know laws, Federal OSHA laws or the direct sources for these laws such as the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), etc. The use of such words or phrases should not be taken to mean that we deem or imply any substance or exposure to be toxic, hazardous or otherwise harmful.

Any exposure can only be understood within the entire context of its occurrence, which includes such factors as the substance's characteristics as defined in the SDS, amount and duration of exposures, other chemicals present and preexisting individual differences in response to the exposure.

The data provided in this SDS is based on the information received from our raw material suppliers and other sources believed to be reliable. We are supplying you this data solely in compliance with the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200 and other Federal and state laws as described in Section 15: Regulatory Information.

The information contained in this SDS is proprietary and confidential to Hexcel Corporation. This SDS and the information in it are not to be used for purposes other than compliance with the Federal OSHA Hazard Communication Standard. If you have received this SDS from any source other than Hexcel Corporation or its authorized agent, the information contained in it may have been modified from the original document and it may not be the most current revision.

Liability, if any, for use of this product is limited to the terms contained in our sale terms and conditions. We do not in any way warrant (expressed or implied, including any implied warranty for merchantability or fitness for a particular purpose) the data contained or the product described in this SDS. Additionally, we do not warrant that the product will not infringe any patent or other proprietary or property rights of others.

Prepared by: Darryl Ong,
Hexcel Corporate Safety and Health,
Senior Product Safety Information Specialist

Revision History:
11/10/11 update to new format, added new address
03/05/10 added the dust clause to section 3 & 5
10/29/08 Update description
01/12/07 Deleted Prop 65, product no longer manufactured in CA. Deleted carbon and aramid fabric from section 2, not considered hazardous by OSHA and ACGIH®.

SAFETY DATA SHEET
HexPly M9.6H

As this product is an Article according to Regulation (EC) No. 1907/2006 (REACH), there is no legal obligation to issue a Safety Data Sheet. This document is supplied for information purposes only and it is not subject to the formal requirements of safety data sheets under the REACH Regulations.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name HexPly M9.6H

Product number 20690EU-1

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses Epoxy resin formulation in film form or film containing continuous fibres of glass, carbon or aramid. Also applies to materials with silver-coated reinforcements.

1.3. Details of the supplier of the safety data sheet

Supplier

Hexcel Composites GmbH & Co.KG
Industriegelaende 2
A-4720 Neumarkt i.H.
Austria
Tel: ++43 (0) 7733 6651 0
Fax: ++43 (0) 7733 6651 145

Contact person

SDSEUOffice@hexcel.com
Duxford, Cambridge, CB22 4QD, UK ++ 44 (0)1223 833141
Industriegelaende 2, A-4720 Neumarkt i.H., Austria. ++ 43 (0)7229 7720
Parc Industriel, Rue 3 Bourdons, 54, B-4840, Welkenraedt, Belgium ++32 87 307411
Sophie-Scholl-Weg 22, 21684 Stade, Germany. ++49 4141 78 79 00
Via S, Cristoforo, 44, 21047 Saronno, Italy. ++39 02 96709082
Polígono Ind., C/Bruselas 10-16, 28980 Parla, Madrid, Spain. ++34 91 664 49 00
45 rue de la Plaine, CS 10027, 01126 Dagneux CEDEX, France, ++33 (0)4 72 25 26 27
Xiqing Economic Development Area, Tianjin, China. ++86 22 2388 9068
5th Floor, Wisma Samudra, Jalan Kontraktor U1/14, Hicom-Glenmarie Industrial Park, 40150 Shah Alam, Selangor, Malaysia. +60 3 5569 3510

1.4. Emergency telephone number

Emergency telephone To be used only for advice on chemical emergencies, spillages, fires or First Aid:
For emergencies in US/Canada: CHEMTREC – 800 424 9300
For emergencies in rest of the world: CARECHEM24 - +44 (0) 1235 239 670

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification

Physical hazards Not Classified

Health hazards Skin Irrit. 2 - H315 Eye Irrit. 2 - H319 Skin Sens. 1 - H317

Environmental hazards Not Classified

2.2. Label elements

HexPly M9.6H

Pictogram

Signal word	Warning
Hazard statements	H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation.
Precautionary statements	P302+P352 IF ON SKIN: Wash with plenty of water. P333+P313 If skin irritation or rash occurs: Get medical advice/attention. P273 Avoid release to the environment. P280 Wear protective clothing and gloves.
Contains	EPOXY RESIN (Number average MW <= 700), EPOXY RESIN (Number average MW >700 - <1100)

2.3. Other hazards

Warning! Dust generated from machining, grinding or sanding the product may be combustible and could result in fire and/or explosion should the necessary dust concentration in air and ignition source be present.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

EPOXY RESIN (Number average MW <= 700) **30-60%**

CAS number: 25068-38-6 EC number: 500-033-5

Classification
Skin Irrit. 2 - H315
Eye Irrit. 2 - H319
Skin Sens. 1 - H317
Aquatic Chronic 2 - H411

EPOXY RESIN (Number average MW >700 - <1100) **30-60%**

CAS number: 25068-38-6

Classification
Skin Irrit. 2 - H315
Eye Irrit. 2 - H319
Skin Sens. 1 - H317

The full text for all hazard statements is displayed in Section 16.

Composition comments The product consists of a resin and fabric component. Possible exposure to the above mentioned chemicals will be as a result of contact with the resin. The above mentioned concentrations have been calculated based only on the resin component; no allowance has been made for the fabric component as this does not provide any dilution effect.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation With any sign of respiratory distress, affected persons should be taken into fresh air, and made to rest while medical attention is sought.

HexPly M9.6H

Ingestion Immediately rinse the mouth repeatedly with water, if swallowing has occurred, do not induce vomiting. If requested, give affected person sips of water. Seek medical attention immediately. If vomiting does occur do not allow the affected person to inhale their vomit. Do not give anything by mouth to an unconscious person.

Skin contact With uncured material, immediately wash the affected area with warm, soapy water then clean the skin with resin removing cream, followed by further washing with warm soapy water. Do not use solvents. If irritation persists, seek medical attention.

Eye contact Flush with water for at least 15 minutes and seek medical attention if irritation persists.

4.2. Most important symptoms and effects, both acute and delayed

Inhalation Inhalation of dusts during cutting, sanding or machining of this product may cause mechanical irritation of the respiratory tract.

Skin contact Contact with dust from cured product may cause mechanical irritation. This product contains component(s) that can cause irritant and allergic contact dermatitis following skin contact with the product or vapours generated during processes using heat. The initial symptoms of irritant and allergic contact dermatitis are itching, redness, swelling, blistering, flaking and cracking.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor No specific recommendations. If in doubt, get medical attention promptly.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards Warning! Dust generated from machining, grinding or sanding the cured product may be combustible and could result in fire and/or explosion should the necessary dust concentration in air and ignition source be present. Carbon fibres contained in some products are electrically conductive and if released during combustion may present a hazard to unprotected electrical apparatus. Refer to section 10 for further details.

Hazardous combustion products The products of combustion and decomposition depend on other materials present in the fire and the actual conditions of the fire. Burning will release carbon dioxide, water, carbon monoxide and compounds of nitrogen.

5.3. Advice for firefighters

Special protective equipment for firefighters Self contained breathing apparatus and full protective clothing must be worn in case of fire.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Wear protective clothing as described in Section 8 of this safety data sheet.

6.2. Environmental precautions

Environmental precautions Due to the physical nature of this product, environmental release to drains and water courses is not possible.

6.3. Methods and material for containment and cleaning up

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Methods for cleaning up Clean affected area, and dispose of product and cleaning materials in accordance with local regulations.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8. For waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid contact with uncured product. Avoid inhalation of dust/fumes generated during processing operations. Dust from machining cured product will contain fibrous material. Avoid inhalation and provide positive dust extraction and collection from cutting zone. Protect against fire and explosion by avoiding dust formation and ignition sources when machining cured product. Dust from products containing carbon fibre is electrically conductive. Wash skin thoroughly after handling. Use appropriate skin cream to prevent drying of skin. Promptly remove any clothing that becomes contaminated. Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store containers, securely closed according to container label instructions. Keep away from food, drink and animal feeding stuffs.

7.3. Specific end use(s)

Specific end use(s) As this product is an article, this section is not applicable.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Ingredient comments No exposure limits known for ingredient(s).

8.2. Exposure controls

Protective equipment

Appropriate engineering controls Provide adequate ventilation for operations involving elevated temperature or dust formation.

Eye/face protection Goggles or face protection should be worn during machining operations.

Hand protection Avoid skin contact by use of impermeable gloves when handling the product. Recommendation: Select a glove type that meets Standard EN374. The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material.

Other skin and body protection Ensure forearms are protected by use of gloves with long gauntlet, disposable sleeves or long sleeve overalls.

Respiratory protection Local exhaust ventilation or an approved respirator should be used where fumes from hot material, or dust from machining cured material arise.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

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Appearance	Flexible resin film containing continuous fibres of glass, carbon or aramid in unidirectional or woven fabric form. Product is protected each side by coloured polythene foil or foil on side and release papercovering on the other.
Colour	Varying.
Odour	Odourless.
Odour threshold	Not applicable due to its low odour.
pH	Not relevant due to the physical form of this product.
Melting point	Not relevant due to the physical form of this product.
Initial boiling point and range	Not relevant due to the physical form of this product.
Flash point	Not relevant due to the physical form of this product.
Evaporation rate	Not relevant due to the physical form of this product.
Flammability (solid, gas)	Not relevant. The product does not contain any flammable constituent.
Upper/lower flammability or explosive limits	Not relevant due to the physical form of this product.
Vapour pressure	Not relevant due to the physical form of this product.
Vapour density	Not relevant due to the physical form of this product.
Relative density	Not relevant due to the physical form of this product.
Bulk density	Not relevant due to the physical form of this product.
Solubility(ies)	The product is supplied in roll form. It is protected each side by polythene foil and /or release paper. The availability of the product to be exposed to a condition where solubility can occur is minimal.
Partition coefficient	Technically not feasible.
Auto-ignition temperature	Technically not feasible. Material will decompose and exotherm before reaching its auto-ignition temperature.
Decomposition Temperature	>300°C
Viscosity	Not relevant due to the physical form of this product.
Explosive properties	Not classified as explosive but dust or airborne filaments could induce explosion in high voltage equipments by short circuit.
Oxidising properties	Does not meet the criteria for classification as oxidising.
Comments	The indicated values do not necessarily correspond to the product specification. Please refer to the technical data sheet for specification data.

9.2. Other information

Other information	No information required.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	Refer to section 10.3 for further details.

10.2. Chemical stability

Stability	Stable under recommended storage temperature as stated in product literature.

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10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Material may react exothermically when exposed to high temperatures; exotherm may be severe if material is in bulk (rolls).

10.4. Conditions to avoid

Conditions to avoid Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials

Materials to avoid Avoid contact with strong acids and alkalis and oxidising materials.

10.6. Hazardous decomposition products

Hazardous decomposition products Thermal decomposition and burning may release oxides of carbon, nitrogen and sulphur. The composition of gases/vapours/by-products generated during decomposition will vary depending on temperature conditions, temperature rate of rise and the presence of other chemicals in the vicinity that may react with the product. Gases/vapours/by-products should be regarded as toxic.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects This product is considered an Article with no intentional release in accordance with EC No. 1907/2006, REACH Regulation. As this product is an Article, there is no requirement to determine its hazard classification. The information provided in this section is a simplified summary of the toxicological health effects derived by voluntarily applying the classification methods for mixtures.

Skin corrosion/irritation

Animal data Causes skin irritation.

Serious eye damage/irritation

Serious eye damage/irritation Causes serious eye irritation.

Skin sensitisation

Skin sensitisation May cause an allergic skin reaction.

SECTION 12: Ecological Information

12.1. Toxicity

Toxicity A Daphnia Immobilisation Study program covering the chemistry family of the saleable product has been conducted to determine the aquatic toxicity of prepregs. Based on the study results, the product is not required to be labelled for supply with the dead fish/dead tree symbol (GHS09) in accordance with CLP Regulation.

12.2. Persistence and degradability

Persistence and degradability There are no data on the degradability of this product.

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Partition coefficient Technically not feasible.

12.4. Mobility in soil

Mobility Not relevant due to the physical form of this product.

12.5. Results of PBT and vPvB assessment

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Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information It is recommended to conduct a risk assessment prior to recycling or re-using paper coverings or any other packaging to ensure the downstream user's exposure to any potential hazard is identified and appropriately managed. For packaging and paper coverings, which may have come into direct contact with the product, the hazard classification and applicable regulatory restriction associated with the chemicals identified in section 3 of the Safety Data Sheet should be considered during the risk assessment to ensure no recycling or re-use in downstream applications/markets where the use would not be approved.

SECTION 14: Transport information

General A Daphnia Immobilisation Study program covering the chemistry family of the saleable product has been conducted to determine the aquatic toxicity of prepregs. Based on the study results, the product is not required to be labelled for supply with the dead fish/dead tree symbol (GHS09) in accordance with CLP Regulation and is not considered as Class 9 in accordance with Dangerous Goods for Transport Regulations for road, sea and air.

14.1. UN number

This product is not dangerous to transport.

14.2. UN proper shipping name

This product is not dangerous to transport.

14.3. Transport hazard class(es)

This product is not dangerous to transport.

14.4. Packing group

This product is not dangerous to transport.

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

This product is not dangerous to transport.

14.6. Special precautions for user

This product is not dangerous to transport.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Product not transported in bulk.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

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National regulations

This product has been classified in accordance with Regulation (EC) No 1272/2008 (CLP).
This product is considered an Article with no intentional release in accordance with EC No. 1907/2006, REACH Regulation.
This product does not contain Annex XIV substances subject to Authorisation according to Regulation (EC) No. 1907/2006 (REACH) or substances of very high concern published in accordance with Article 59(10) above 0.1 % (w/w).

15.2. Chemical safety assessment

Inventories

US - TSCA

This product is an article as defined by TSCA and is not required to be listed in the US, EPA, TSCA Inventory.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet

ATE Acute Toxicity Estimate
ADR European Agreement concerning the International Carriage of Dangerous Goods by Road
CLP Classification, Labelling and Packaging Regulation; Regulation (EC) No 1272/2008
CAS# Chemical Abstracts Service number
DNEL Derived No Effect Level
EC# EINECS and ELINCS Number
EINECS European Inventory of Existing Commercial Substances
ELINCS European List of Notified Chemical Substances
EmS Emergency Response Procedures for Ships Carrying Dangerous Goods
EPA Environmental Protection Agency
EU European Union
GHS Globally Harmonised System
IATA International Air Transport Association
ICAO International Civil Aviation Organization
IMDG International Maritime Dangerous Goods
Kow Octanol-water partition coefficient
LC50 Lethal concentration to 50% of a test population
LD50 Lethal dose to 50% of a test population (Median Lethal Dose)
n.o.s. Not otherwise specified
PBT Persistent, Bioaccumulative and Toxic substance
PNEC Predicted No Effect Concentration
PPE Personal Protection Equipment
REACH Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
SADT Self-accelerating decomposition temperature
SCBA Self-Contained Breathing Apparatus
STOT Specific Target Organ Toxicity
(STOT) RE Repeated Exposure
(STOT) SE Single Exposure
SVHC Substance of Very High Concern
TSCA Toxic Substances Control Act
UN United Nations
VOC Volatile Organic Compound
vPvB Very Persistent and very Bioaccumulative

General information

This safety data sheet has been written in accordance with the requirements of the Commission Regulation (EC) No 453/2010 of 20 May 2010.

Classification procedures according to Regulation (EC) 1272/2008

Eye Irrit. 2 - H319: Calculation method. Skin Irrit. 2 - H315: Calculation method. Skin Sens. 1 - H317: Calculation method.

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Revision comments	NOTE: Lines within the margin indicate significant changes from the previous revision.
Issued by	European Product Stewardship Department
Revision date	01/05/2015
Revision	2
Supersedes date	20/09/2013
Hazard statements in full	H315 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H411 Toxic to aquatic life with long lasting effects.

The product should be used in accordance with good industrial hygiene practice and compliance with any legal requirements. All information has been compiled with due diligence and is based on the present state of our knowledge. It is intended to describe the product from a point of view of safety and should not therefore be construed as guaranteeing any specific property. All products are supplied subject to our Standard Conditions of Sale which contains limitations on liability.

SAFETY DATA SHEET
Denat. ethanol 93%

SDS according to Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex II-EU

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Date issued	10.11.2015
Revision date	27.08.2015

1.1. Product identifier

Product name	Denat. ethanol 93%

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	ES 1 SU21 Consumer uses: Private households (= general public = consumers) PC4 Antifreeze and Deicing products PC35 Washing and cleaning products (including solvent based products)

1.3. Details of the supplier of the safety data sheet

Company name	Borup Kemi I/S
Postal address	Bækgårdsvej 53
Postcode	DK-4140
City	Borup
Country	Denmark
Tel	57 56 00 20
Fax	57 56 00 21
E-mail	kontakt@borup-kemi.dk
Website	http://www.borup-kemi.dk

1.4. Emergency telephone number

Emergency telephone	Use your national or local emergency number - See section 4 “First aid measures”.:-

SECTION 2: Hazards identification

2.1. Classification of substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]	Flam. Liq. 2;H225;

2.2. Label elements

Hazard Pictograms (CLP)

Signal word	Danger
Hazard statements	H225 Highly flammable liquid and vapour.
Precautionary statements	P101 If medical advice is needed, have product container or label at hand. P102 Keep out of reach of children.

	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P403+P235 Store in a well-ventilated place. Keep cool. P501 Indholdet/beholderen bortskaffes i henhold til lokale affaldsregulativer.
Tactile warnings	Yes

2.3. Other hazards

Description of hazard	This product contains an organic solvent. Repeated exposure to organic solvents can result in damage to the nervous system and inner organs, such as the liver and kidneys.
Other hazards	Product contains low-boiling liquids. If using respirators must be self-contained.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Substance	Identification	Classification	Contents
Ethanol	CAS no.: 64-17-5 EC no.: 200-578-6 Index no.: 603-002-00-5 Synonyms: ethyl alcohol	Flam. Liq. 2; H225;	93 vægt%
butanone	CAS no.: 78-93-3 EC no.: 201-159-0 Index no.: 606-002-00-3 Registration number: 01-2119457290-43-XXXX Synonyms: ethyl methyl ketone	Flam. Liq. 2;H225; Eye Irrit. 2;H319; STOT SE3;H336; EUH 066;	2 vægt%
Substance comments	6) See also section 16.		

SECTION 4: First aid measures

4.1. Description of first aid measures

General	If medical advice is needed, have product container or label at hand. Burns: Flush with water until pain ceases. Remove clothing that is not stuck to the skin – seek medical advice/transport to hospital. If possible, continue flushing until medical attention is obtained.
Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Keep victim under observation. Get medical advice/attention if you feel unwell.
Skin contact	Remove contaminated clothing. Wash skin with soap and water. Hudrensemiddel kan anvendes. Seek medical advice in case of persistent discomfort.
Eye contact	Flush with water (preferably using eye wash equipment) until irritation subsides. Seek medical advice if symptoms persist.
Ingestion	Wash out mouth thoroughly and drink 1-2 glasses of water in small sips. Do NOT induce vomiting. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

General symptoms and effects	Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin's natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens. Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally

	irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

4.3. Indication of any immediate medical attention and special treatment needed

Other Information	No special immediate treatment required. Medbring dette sikkerhedsdatablad.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Extinguish with powder, foam, carbon dioxide or water mist.
Improper extinguishing media	Do not use water stream, as it may spread the fire.

5.2. Special hazards arising from the substance or mixture

Fire and explosion hazards	If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced.
Hazardous combustion products	These are oxides of carbon. Fire will produce dense black smoke. Exposure to decomposition products may cause a health hazard.

5.3. Advice for firefighters

Personal protective equipment	Use personal protective equipment as required.
Fire fighting procedures	Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	Not ignited stock cooled with water spray. Eliminate all ignition sources if safe to do so. Ensure adequate ventilation. Smoking and naked flames prohibited. Take precautionary measures against static discharges. Use spark-free tools and explosion proof equipment.

6.2. Environmental precautions

Environmental precautionary measures	Do not discharge large quantities of concentrated spills and residue into drains.

6.3. Methods and material for containment and cleaning up

Cleaning method	Contain and absorb spill with sand or other absorbent, non-combustible material and transfer to suitable waste containers.
Clean up	Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided.

6.4. Reference to other sections

Other instructions	See section 8 for type of protective equipment. See section 13 for instructions on disposal.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling	See section 8 for information about precautions for use and personal protective equipment.

7.2. Conditions for safe storage, including any incompatibilities

Storage	The product should be stored safely, out of reach of children and away from food, animal feeding stuffs, medicines, etc. Keep in tightly closed original packaging. Store in a dry, cool, well-ventilated area. Keep fireproof. Emergency Services technical regulations for flammable liquids must be strictly followed, including rules for flammable storage.
Other Information	Fire Class - 2, storage unit max 1 liter. There should be discarded 25 units

	without fire regulatory approval

Conditions for safe storage

Requirements for storage rooms and vessels	Cool and frostfree.

7.3. Specific end use(s)

Specific use(s)	See application section 1

Specific end users

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure limit values

Substance	Identification	Value	TWA Year
Ethanol	CAS no.: 64-17-5 EC no.: 200-578-6 Index no.: 603-002-00-5 Synonyms: ethyl alcohol	8-hour TWA: 1000 ppm 8-hour TWA: 1920 mg/m3	
butanone	CAS no.: 78-93-3 EC no.: 201-159-0 Index no.: 606-002-00-3 Registration number: 01-2119457290-43-XXXX Synonyms: ethyl methyl ketone	8-hour TWA: 200 ppm Sk, BMGV 8-hour TWA: 600 mg/m3 Sk, BMGV 15 min.: 300 ppm Sk, BMGV 15 min.: 899 mg/m3 Sk, BMGV Sk = Can be absorbed through the skin.	

DNEL / PNEC from substances

Substance	Ethanol
DNEL	Group: Worker Exposure route: Inhalation Exposure frequency: Short term (acute) Type of effect: Local effect Value: 1900 mg/m3
DNEL	Group: Worker Exposure route: Dermal Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 343 mg/kg bw/day
DNEL	Group: Worker Exposure route: Inhalation Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 950 mg/m3
DNEL	Group: Consumer Exposure route: Inhalation Exposure frequency: Short term (acute) Type of effect: Local effect Value: 950 mg/m3
DNEL	Group: Consumer Exposure route: Oral Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 87 mg/kg bw/day

DNEL	Group: Consumer Exposure route: Dermal Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 206 mg/kg bw/day
DNEL	Group: Consumer Exposure route: Inhalation Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 114 mg/m3
PNEC	Exposure route: Water Value: 0,96 mg/L Remarks: Fresh Water
PNEC	Exposure route: Water Value: 0,79 mg/L Remarks: Marine Water
PNEC	Exposure route: Water Value: 2,75 mg/L Remarks: Intermittent releases Water
PNEC	Exposure route: Soil Value: 0,63 mg/kg soil dw
Substance	butanone
DNEL	Group: Consumer Exposure route: Inhalation Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 106 mg/m³
DNEL	Group: Consumer Exposure route: Dermal Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 412 mg/kg bw/day
DNEL	Group: Consumer Exposure route: Oral Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 31 mg/kg bw/day
DNEL	Group: Worker Exposure route: Inhalation Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 600 mg/m³
DNEL	Group: Worker Exposure route: Dermal Exposure frequency: Long term (repeated) Type of effect: Systemic effect Value: 1161 mg/kg bw/day
PNEC	Exposure route: Soil Value: 22.5 mg/kg soil dw
PNEC	Exposure route: Water Value: 55.8 mg/L Remarks: Intermittent releases
PNEC	Exposure route: Water Value: 55.8 mg/L Remarks: Marine

PNEC	Exposure route: Water Value: 55.8 mg/L Remarks: Fresh

8.2. Exposure controls

Recommended monitoring procedures	Compliance with the stated exposure limits values should be checked on a regular basis.

Safety signs

Precautionary measures to prevent exposure

Appropriate engineering controls	Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see above). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.
Instruction on measures to prevent exposure	Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Respiratory protection

Respiratory protection	Wear full-face mask with fresh air supply. (without motor fan).

Hand protection

Hand protection	Wear protective gloves made of butyl rubber.

Eye / face protection

Eye protection	Use face shield. Alternatively, safety glasses with side shields used

Skin protection

Skin protection (except hands)	Not required.

Hygiene / Environmental

Specific hygiene measures	Smoking, consumption of food or liquid, and storage of tobacco, food or liquid, are not allowed in the workroom.

Exposure controls

Exposure controls and personal protection, additional info.	Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values above. If the work is covered by the regulations on work involving coded products (WEA Order no. 302/1993, Denmark), protection gear accordingly. See also. product code in the section on 'Hazard Identification'.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Colour	Colourless
Odour	Alcohol
Melting point/melting range	Value: = -112 °C
Boiling point / boiling range	Value: = 78 °C
Flash point	Value: = 13 °C
Lower explosion limit with unit of measurement	Value: ~ 3,3 - 19 vol%
Vapour pressure	Value: = 43 mm Hg
Specific gravity	Value: = 0,81 g/cm3
Solubility in water	Soluble
Solubility in fat	Opløselighed i fedt

Spontaneous combustability	Value: = 371 °C
Viscosity	Value: = 1,4 centistokes

9.2. Other information

Other physical and chemical properties

Comments	None.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	No data available

10.2. Chemical stability

Stability	Flammable. Normally stable at recommended storage conditions. The vapors can ignite at temperatures above the flash point.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions	No special.

10.4. Conditions to avoid

Conditions to avoid	Take precautionary measures against static discharge. Do not expose to heat (eg. Sunlight), because pressure can be developed

10.5. Incompatible materials

Materials to avoid	Avoid contact with strong acids. Avoid contact with strong bases. Avoid contact with strong oxidising agents. Avoid contact with strong reducing agents.

10.6. Hazardous decomposition products

Hazardous decomposition products	If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological data for substances

Substance	Ethanol
LD50 oral	Value: 10470 mg/kg bw Animal test species: rat
LD50 dermal	Value: > 20000 mL/kg bw Animal test species: rabbit
LC50 inhalation	Value: 124,7 mg/L air Animal test species: rat Duration: 4 h
Substance	butanone
LD50 oral	Value: 4,29 mL/kg bw Animal test species: Rat
LD50 dermal	Value: > 10 mL/kg bw Animal test species: Rabbit

Potential acute effects

Inhalation	The product releases organic solvent vapours which may cause lethargy and dizziness. At high concentrations, the vapours may cause headache and intoxication.
Skin contact	May irritate the skin – may cause reddening.
Eye contact	May cause eye irritation.
Ingestion	Ingestion may cause discomfort.

Delayed effects / repeated exposure

General	Prolonged or repeated inhalation of vapors may damage the central nervous

	system.
Skin contact	Contact with irritant substances may result in the contact area is more prone to absorb harmful substances such as allergens.

Symptoms of Exposure

Other Information	There is not an exposure scenario for this product.

SECTION 12: Ecological information

12.1. Toxicity

Toxicological data for substances

Substance	Ethanol
Acute aquatic, fish	Value: 14,2 g/L Method of testing: LC50 Duration: 96 h
Acute aquatic, algae	Value: ~ 1,96 g/L Method of testing: EC50 Duration: 96 h
Acute aquatic, Daphnia	Value: 5012 mg/L Method of testing: LC50 Duration: 48 h
Biodegradability	Value: 97 Test period: 28 days Method of testing: OECD Guideline 301 B
Bioaccumulation	Log Pow = -0,35
Substance	butanone
Acute aquatic, fish	Value: 2993 mg/L Method of testing: LC50 Duration: 96 h
Acute aquatic, algae	Value: 1972 mg/L Method of testing: EC50 Duration: 72 h
Acute aquatic, Daphnia	Value: 308 mg/L Method of testing: EC50 Duration: 48 h
Biodegradability	Value: 98 Test period: 28 days Method of testing: OECD Guideline 301 D
Bioaccumulation	Log Pow = 0,3

12.2. Persistence and degradability

Persistence and degradability	Readily biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential	The product is not bioaccumulable.

12.4. Mobility in soil

Mobility	Test data are not available.

12.5. Results of PBT and vPvB assessment

PBT assessment results	The mixture does not meet the criteria for PBT or vPvB.

12.6. Other adverse effects

Other adverse effects / Remarks	None.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Specify the appropriate methods of	Collect spills and waste in closed, leak-proof containers for disposal at the

disposal	local hazardous waste site.
Hazardous waste packing	Packaging which contains residual product must be disposed of the same way as product.
EWC waste code	EWC: 20 01 13 solvents

SECTION 14: Transport information

14.1. UN number

ADR	1170
RID	1170
IMDG	1170
ICAO/IATA	1170

14.2. UN proper shipping name

ADR	ETHYL ALCOHOL SOLUTION
RID	ETHYL ALCOHOL SOLUTION
IMDG	ETHYL ALCOHOL SOLUTION
ICAO/IATA	ETHYL ALCOHOL SOLUTION

14.3. Transport hazard class(es)

ADR	3
Hazard no.	33
RID	3
IMDG	3
ICAO/IATA	3

14.4. Packing group

ADR	II
RID	II
IMDG	II
ICAO/IATA	II

14.5. Environmental hazards

14.6. Special precautions for user

EmS	F-E, S-D

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Legislation and regulations	People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC. For exceptions, see the Danish Working Environment Authority's Executive Order No. 239 of 6 April 2005.

15.2. Chemical safety assessment

Chemical safety assessment performed	No

SECTION 16: Other information

1993-kodenr. (DK)	2-1
Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]	Flam. Liq. 2; H225;
List of relevant H-phrases (Section 2 and 3).	H336 May cause drowsiness or dizziness. EUH 066 Repeated exposure may cause skin dryness or cracking. H225 Highly flammable liquid and vapour.

	H319 Causes serious eye irritation.
Additional information	It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification. The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
Important data sources used to construct the safety data sheet	Data sources in Denmark. Arbejdstilsynets bekendtgørelse nr. 301 af 13. maj 1993 om fastsættelse af kodenumre. Arbejdstilsynets bekendtgørelse nr. 292 af 26. april 2001 om arbejde med stoffer og materialer (kemiske agenser). Arbejdstilsynets bekendtgørelse nr. 239 af 6. april 2005 om unges arbejde. Bekendtgørelse nr. 1049 af 27. oktober 2005 om markedsføring og mærkning af flygtige organiske forbindelser i visse malinger og lakker samt produkter til autoreparationslakering. Bekendtgørelse nr. 1075 af 24. november 2011 om klassificering, emballering, mærkning, salg og opbevaring af stoffer og Cellulosefortynder Side 13 af 14 blandinger. Bekendtgørelse nr. 878 af 26. juni 2010 af lov om kemiske stoffer og produkter. Bekendtgørelse nr. 559 af 04/07/2002 om særlige pligter for fremstillere, leverandører og importører mv. af stoffer og materialer efter lov om arbejdsmiljø. Bekendtgørelse nr. 507 af 17/05/2011 om grænseværdier for stoffer og materialer, med senere ændringer. Bekendtgørelse nr. 1309 af 18/12/2012 om affald. EU forordning nr. 1907/2006 (REACH). EU forordning nr. 1272/2008 (CLP), med senere tilpasninger. ECHA □ □ Det europæiske kemikalieagentur
Version	1
Responsible for safety data sheet	Borup Kemi I/S
Comments	Valideret af mediator A/S - DH.

Safety Data Sheet

QYA130 Intercryl 700 Base Light

Version No. 3 **Date Last Revised** 20/12/12

Conforms to the requirements of Regulation (EC) No.1907/2006 (REACH), Annex II

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier Intercryl 700 Base Light

Product Code QYA130

Registration Number

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use Finish coat for water based and solvent based systems

Application Method See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Manufacturer International Paint Ltd.
Stoneygate Lane
Felling Gateshead
Tyne and Wear
NE10 0JY UK

Telephone No. +44 (0)191 469 6111

Fax No. +44 (0)191 438 3711

1.4. Emergency telephone number

Manufacturer +44 (0)191 469 6111 24hr

Official Advisory Body Telephone No.:
Advice for Doctors and Hospitals

+44 (0)844 892 0111

Email sdsfellingUK@akzonobel.com

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Mixture NOT yet classified according to Regulation (EC) No. 1272/2008

Classification according to 67/548/EEC or 1999/45/EC.

2.2. Label elements

According to 1999/45/EC

Contains:

S23 Do not breathe vapour/spray.
S39 Wear eye/face protection.

S51 Use only in well-ventilated areas.

P. Phrases;

2.3. Other hazards

This product contains no PBT/vPvB chemicals.

SECTION 3: Composition/information on ingredients

If the product contains substances that present a health hazard within the meaning of the Dangerous Substances Directive 67/548/EC, or have occupational exposure limits detailed in EH40, these substances are listed below.

Ingredient/Chemical Designations	Weight %	67/548/EEC Classification	EC No. 1272/2008 Classification	Notes
Butyl diglycol **CAS Number: 0000112-34-5** **EC No. 203-961-6** **Index No.: 603-096-00-8** **REACH Reg. No.:**	**1 - < 2.5**	**Xi;R36**	**Eye Irrit. 2;H319**	**[1]**

[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.

*The full texts of the phrases are shown in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General

In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

Inhalation

Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Skin

Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognised skin cleanser. Do NOT use solvents or thinners.

Eye

Irrigate copiously with clean fresh water for at least 10 minutes, holding the eyelids apart and seek medical attention.

Ingestion

If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

No data available

4.3. Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Recommended extinguishing media; alcohol resistant foam, CO^2. powder, water spray.

Do not use; water jet.

5.2. Special hazards arising from the substance or mixture

Fire will produce dense black smoke. Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.
Avoid exposure and use breathing apparatus as appropriate.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove sources of ignition, do not turn lights or unprotected electrical equipment on or off. In case of a major spill or spillage in a confined space evacuate the area and check that solvent vapour levels are below the Lower Explosive Limit before re-entering.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

Ventilate the area and avoid breathing vapours. Take the personal protective measures listed in section 8.

Contain and absorb spillage with non-combustible materials e.g. sand, earth, vermiculite. Place in closed containers outside buildings and dispose of according to the Waste Regulations. (See section 13).

Clean, preferably with a detergent. Do not use solvents.

Do not allow spills to enter drains or watercourses.

If drains, sewers, streams or lakes are contaminated, inform the local water company immediately. In the case of contamination of rivers, streams or lakes the Environmental Protection Agency should also be informed.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling

This coating contains solvents. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Areas of storage, preparation and application should be ventilated to prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the occupational exposure limits.

In Storage

Handle containers carefully to prevent damage and spillage.

Naked flames and smoking should not be permitted in storage areas. It is recommended that fork lift trucks and electrical equipment are protected to the appropriate standard.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from the following materials: oxidising agents, strong alkalis, strong acids.

Avoid skin and eye contact. Avoid inhalation of vapours and spray mists. Observe label precautions. Use personal protection as shown in section 8.

Smoking, eating and drinking should be prohibited in all preparation and application areas.

Never use pressure to empty a container; containers are not pressure vessels.

Store in a well ventilated, dry place away from sources of heat and direct sunlight.

Store on concrete or other impervious floor, preferably with bunding to contain any spillage. Do not stack more than 3 pallets high.

Keep container tightly closed. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in the original container or one of the same material.

Prevent unauthorised access.

7.3. Specific end use(s)

There are no exposure scenarios, see details in section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

The following workplace exposure limits have been established by the Health and Safety Executive as published in EH40.

Material	Short term (15 min. ave)		Long term (8hr TWA)		Comments
	ppm	mg/m^3	ppm	mg/m3	
Butyl diglycol	**15**	**101.2**	**10**	**67.5**	

For Key to entries in 'Comments' column see Section 16

DNEL/PNEC values

No Data Available

8.2. Exposure controls

Provide adequate ventilation.Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapour below occupational exposure limits suitable respiratory protection must be worn.

Eye/face protection

Wear safety eyewear, e.g. safety spectacles, goggles or visors to protect against the splash of liquids. Eyewear should meet the requirements of standard EN 166.

Skin protection

For prolonged or repeated contact use protective gloves. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has occurred. Skin should be washed after contact.

Use chemical resistant gloves classified under Standard EN 374: Protective gloves against chemicals and micro-organisms. Recommended gloves: Viton® or Nitrile
Breakthrough Time: 480 min

When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 2 or higher (breakthrough time greater than 30 minutes according to EN 374) is recommended.

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

The user must check that the final choice of type of glove selected for handling this product is the most appropriate and takes into account the particular conditions of use, as included in the user's risk assessment.

Other

Overalls which cover the body, arms and legs should be worn. Skin should not be exposed. Barrier creams may help to protect areas which are difficult to cover such as the face and neck. They should however not be applied once exposure has occurred. Petroleum jelly based types such as Vaseline should not be used. All parts of the body should be washed after contact.

Respiratory protection

If workers are exposed to concentrations above the exposure limit they must use the appropriate,certified respirators.For maximum protection when spraying this product it is recommended that a multi layer combination type filter, such as ABEK1, is used. In confined spaces use compressed air or fresh air respiratory equipment.

Thermal hazards

No Data Available

SECTION 9: Physical and chemical properties

Appearance	Light Coloured Liquid
Odour	No smell
Odour threshold	Not Measured
pH	Not Measured
Melting point / freezing point (°C)	Not Measured
Initial boiling point and boiling range (°C)	100
Flash point (°C)	101
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: Not Measured
	Upper Explosive Limit: Not Measured
Vapour pressure (Pa)	Not Measured
Vapour density	Heavier than air.
Relative density	1.18
Solubility(ies)	Miscible
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature (°C)	Not Measured
Decomposition temperature (°C)	Not Measured
Viscosity (cSt)	50

9.2. Other information

No further information

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

Stable under recommended storage and handling conditions (see section 7).When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide, carbon dioxide, oxides of nitrogen and smoke.

Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid possible exothermic reactions.

10.3. Possibility of hazardous reactions

May react exothermically with: oxidising agents, strong alkalis, strong acids.

10.4. Conditions to avoid

Stable under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Keep away from the following materials: oxidising agents, strong alkalis, strong acids.

10.6. Hazardous decomposition products

Fire will produce dense black smoke. Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.
Avoid exposure and use breathing apparatus as appropriate.

SECTION 11: Toxicological information

Acute toxicity

Exposure to solvent vapour concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapour LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
Butyl diglycol - (112-34-5)	5,660.00, Rat	2,700.00, Rabbit	Not Available	Not Available

SECTION 12: Ecological information

12.1. Toxicity

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is not classified as dangerous for the environment

There are no data available on the product itself.

The product should not be allowed to enter drains or water courses.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Butyl diglycol - (112-34-5)	1,300.00, Lepomis macrochirus	100.00, Daphnia magna	Not Available

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Do not allow into drains or water courses. Wastes and emptied containers should be disposed of in accordance with regulations made under the Control of Pollution Act and the Environmental Protection Act.

Using information provided in this data sheet advice should be obtained from the Waste Regulation Authority, whether the special waste regulations apply.

European Waste Catalogue Classification: 08 01 12 Waste paint other than those mentioned in 08 01 11

SECTION 14: Transport information

14.1. UN number

14.2. UN proper shipping name Non hazardous

14.3. Transport hazard class(es)

ADR/RID/ADN Non hazardous

IMDG	**class/div**	**Sub Class** -
	Segregation Group	No segregation group appropriate
	EmS	
ICAO/IATA	**Air class**	**Sub Class** -

14.4. Packing group

14.5. Environmental hazards

ADR/RID/ADN Environmentally Hazardous: No

IMDG Marine Pollutant: No

14.6. Special precautions for user

No further information

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

SECTION 15: Regulatory information

EU Legislation

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

National Legislation

UKSI 2009 No. 716 CHEMICALS (HAZARD INFORMATION AND PACKAGING FOR SUPPLY) REGULATIONS 2009.

SECTION 16: Other information

IMPORTANT NOTE: the information contained in this data sheet (as may be amended from time to time) is not intended to be exhaustive and is presented in good faith and believed to be correct as of the date on which it is prepared. It is the user's responsibility to verify that this data sheet is current prior to using the product to which it relates.

Persons using the information must make their own determinations as to the suitability of the relevant product for their purposes prior to use. Where those purposes are other than as specifically recommended in this safety data sheet, then the user uses the product at their own risk.

MANUFACTURER'S DISCLAIMER: the conditions, methods and factors affecting the handling, storage, application, use and disposal of the product are not under the control and knowledge of the manufacturer. Therefore the manufacturer does not assume responsibility for any adverse events which may occur in the handling, storage, application, use, misuse or disposal of the product and, so far as permitted by applicable law, the manufacturer expressly disclaims liability for any and all loss, damages and/or expenses arising out of or in any way connected to the storage, handling, use or disposal of the product. Safe handling, storage, use and disposal are the responsibility of the users. Users must comply with all applicable health and safety laws.

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The information in this Health & Safety Data Sheet is required pursuant to EC Regulation 1907(2006) and the Chemicals (Hazard Information & Packaging for Supply) Regulations 2009.

Key to 'Comments' column in Section 8.
(+) There is a risk of absorption through unbroken skin.
(C) Capable of causing cancer and/or heritable genetic damage.
(R) Suppliers recommended limit.
(S) Capable of causing occupational asthma.

The full text of the R, H & EUH phrases appearing in section 3 is:

H319 Causes serious eye irritation.

R36 Irritating to eyes.

The following sections have changed since the previous revision.

End of document

Your attention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites : www.yachtpaint.com , www.international-marine.com, www.international-pc.com

Safety Data Sheet

QYA130 Intercryl 700 Base Light

Version No. 3 **Date Last Revised** 20/12/12

Conforms to the requirements of Regulation (EC) No.1907/2006 (REACH), Annex II

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier Intercryl 700 Base Light

Product Code QYA130

Registration Number

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use Finish coat for water based and solvent based systems

Application Method See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Manufacturer International Paint Ltd.
Stoneygate Lane
Felling Gateshead
Tyne and Wear
NE10 0JY UK

Telephone No. +44 (0)191 469 6111

Fax No. +44 (0)191 438 3711

1.4. Emergency telephone number

Manufacturer +44 (0)191 469 6111 24hr

Official Advisory Body Telephone No.:
Advice for Doctors and Hospitals

+44 (0)844 892 0111

Email sdsfellingUK@akzonobel.com

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Mixture NOT yet classified according to Regulation (EC) No. 1272/2008

Classification according to 67/548/EEC or 1999/45/EC.

2.2. Label elements

According to 1999/45/EC

Contains:

S23 Do not breathe vapour/spray.
S39 Wear eye/face protection.

S51 Use only in well-ventilated areas.

P. Phrases;

2.3. Other hazards

This product contains no PBT/vPvB chemicals.

SECTION 3: Composition/information on ingredients

If the product contains substances that present a health hazard within the meaning of the Dangerous Substances Directive 67/548/EC, or have occupational exposure limits detailed in EH40, these substances are listed below.

Ingredient/Chemical Designations	Weight %	67/548/EEC Classification	EC No. 1272/2008 Classification	Notes
Butyl diglycol **CAS Number: 0000112-34-5** **EC No. 203-961-6** **Index No.: 603-096-00-8** **REACH Reg. No.:**	**1 - < 2.5**	**Xi;R36**	**Eye Irrit. 2;H319**	**[1]**

[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.

*The full texts of the phrases are shown in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General

In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

Inhalation

Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Skin

Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognised skin cleanser. Do NOT use solvents or thinners.

Eye

Irrigate copiously with clean fresh water for at least 10 minutes, holding the eyelids apart and seek medical attention.

Ingestion

If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

No data available

4.3. Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Recommended extinguishing media; alcohol resistant foam, CO^2. powder, water spray.

Do not use; water jet.

5.2. Special hazards arising from the substance or mixture

Fire will produce dense black smoke. Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.
Avoid exposure and use breathing apparatus as appropriate.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove sources of ignition, do not turn lights or unprotected electrical equipment on or off. In case of a major spill or spillage in a confined space evacuate the area and check that solvent vapour levels are below the Lower Explosive Limit before re-entering.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

Ventilate the area and avoid breathing vapours. Take the personal protective measures listed in section 8.

Contain and absorb spillage with non-combustible materials e.g. sand, earth, vermiculite. Place in closed containers outside buildings and dispose of according to the Waste Regulations. (See section 13).

Clean, preferably with a detergent. Do not use solvents.

Do not allow spills to enter drains or watercourses.

If drains, sewers, streams or lakes are contaminated, inform the local water company immediately. In the case of contamination of rivers, streams or lakes the Environmental Protection Agency should also be informed.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handling

This coating contains solvents. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Areas of storage, preparation and application should be ventilated to prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the occupational exposure limits.

In Storage

Handle containers carefully to prevent damage and spillage.

Naked flames and smoking should not be permitted in storage areas. It is recommended that fork lift trucks and electrical equipment are protected to the appropriate standard.

7.2. Conditions for safe storage, including any incompatibilities

Keep away from the following materials: oxidising agents, strong alkalis, strong acids.

Avoid skin and eye contact. Avoid inhalation of vapours and spray mists. Observe label precautions. Use personal protection as shown in section 8.

Smoking, eating and drinking should be prohibited in all preparation and application areas.

Never use pressure to empty a container; containers are not pressure vessels.

Store in a well ventilated, dry place away from sources of heat and direct sunlight.

Store on concrete or other impervious floor, preferably with bunding to contain any spillage. Do not stack more than 3 pallets high.

Keep container tightly closed. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in the original container or one of the same material.

Prevent unauthorised access.

7.3. Specific end use(s)

There are no exposure scenarios, see details in section 1.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

The following workplace exposure limits have been established by the Health and Safety Executive as published in EH40.

Material	Short term (15 min. ave)		Long term (8hr TWA)		Comments
	ppm	mg/m^3	ppm	mg/m3	
Butyl diglycol	**15**	**101.2**	**10**	**67.5**	

For Key to entries in 'Comments' column see Section 16

DNEL/PNEC values

No Data Available

8.2. Exposure controls

Provide adequate ventilation.Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapour below occupational exposure limits suitable respiratory protection must be worn.

Eye/face protection

Wear safety eyewear, e.g. safety spectacles, goggles or visors to protect against the splash of liquids. Eyewear should meet the requirements of standard EN 166.

Skin protection

For prolonged or repeated contact use protective gloves. Barrier creams may help to protect the exposed areas of skin, they should however not be applied once exposure has occurred. Skin should be washed after contact.

Use chemical resistant gloves classified under Standard EN 374: Protective gloves against chemicals and micro-organisms. Recommended gloves: Viton® or Nitrile
Breakthrough Time: 480 min

When prolonged or frequently repeated contact may occur, a glove with a protection class of 6 (breakthrough time greater than 480 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 2 or higher (breakthrough time greater than 30 minutes according to EN 374) is recommended.

NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

The user must check that the final choice of type of glove selected for handling this product is the most appropriate and takes into account the particular conditions of use, as included in the user's risk assessment.

Other

Overalls which cover the body, arms and legs should be worn. Skin should not be exposed. Barrier creams may help to protect areas which are difficult to cover such as the face and neck. They should however not be applied once exposure has occurred. Petroleum jelly based types such as Vaseline should not be used. All parts of the body should be washed after contact.

Respiratory protection

If workers are exposed to concentrations above the exposure limit they must use the appropriate,certified respirators.For maximum protection when spraying this product it is recommended that a multi layer combination type filter, such as ABEK1, is used. In confined spaces use compressed air or fresh air respiratory equipment.

Thermal hazards

No Data Available

SECTION 9: Physical and chemical properties

Appearance	Light Coloured Liquid
Odour	No smell
Odour threshold	Not Measured
pH	Not Measured
Melting point / freezing point (°C)	Not Measured
Initial boiling point and boiling range (°C)	100
Flash point (°C)	101
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: Not Measured
	Upper Explosive Limit: Not Measured
Vapour pressure (Pa)	Not Measured
Vapour density	Heavier than air.
Relative density	1.18
Solubility(ies)	Miscible
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature (°C)	Not Measured
Decomposition temperature (°C)	Not Measured
Viscosity (cSt)	50

9.2. Other information

No further information

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

Stable under recommended storage and handling conditions (see section 7).When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide, carbon dioxide, oxides of nitrogen and smoke.

Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid possible exothermic reactions.

10.3. Possibility of hazardous reactions

May react exothermically with: oxidising agents, strong alkalis, strong acids.

10.4. Conditions to avoid

Stable under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

Keep away from the following materials: oxidising agents, strong alkalis, strong acids.

10.6. Hazardous decomposition products

Fire will produce dense black smoke. Decomposition products may include the following materials: carbon monoxide, carbon dioxide, smoke, oxides of nitrogen.
Avoid exposure and use breathing apparatus as appropriate.

SECTION 11: Toxicological information

Acute toxicity

Exposure to solvent vapour concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapour LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
Butyl diglycol - (112-34-5)	5,660.00, Rat	2,700.00, Rabbit	Not Available	Not Available

SECTION 12: Ecological information

12.1. Toxicity

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is not classified as dangerous for the environment

There are no data available on the product itself.

The product should not be allowed to enter drains or water courses.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Butyl diglycol - (112-34-5)	1,300.00, Lepomis macrochirus	100.00, Daphnia magna	Not Available

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Do not allow into drains or water courses. Wastes and emptied containers should be disposed of in accordance with regulations made under the Control of Pollution Act and the Environmental Protection Act.

Using information provided in this data sheet advice should be obtained from the Waste Regulation Authority, whether the special waste regulations apply.

European Waste Catalogue Classification: 08 01 12 Waste paint other than those mentioned in 08 01 11

SECTION 14: Transport information

14.1. UN number

14.2. UN proper shipping name Non hazardous

14.3. Transport hazard class(es)

ADR/RID/ADN Non hazardous

IMDG	**class/div**	**Sub Class** -
	Segregation Group	No segregation group appropriate
	EmS	
ICAO/IATA	**Air class**	**Sub Class** -

14.4. Packing group

14.5. Environmental hazards

ADR/RID/ADN Environmentally Hazardous: No

IMDG Marine Pollutant: No

14.6. Special precautions for user

No further information

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

SECTION 15: Regulatory information

EU Legislation

REGULATION (EC) No 1272/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

National Legislation

UKSI 2009 No. 716 CHEMICALS (HAZARD INFORMATION AND PACKAGING FOR SUPPLY) REGULATIONS 2009.

SECTION 16: Other information

IMPORTANT NOTE: the information contained in this data sheet (as may be amended from time to time) is not intended to be exhaustive and is presented in good faith and believed to be correct as of the date on which it is prepared. It is the user's responsibility to verify that this data sheet is current prior to using the product to which it relates.

Persons using the information must make their own determinations as to the suitability of the relevant product for their purposes prior to use. Where those purposes are other than as specifically recommended in this safety data sheet, then the user uses the product at their own risk.

MANUFACTURER'S DISCLAIMER: the conditions, methods and factors affecting the handling, storage, application, use and disposal of the product are not under the control and knowledge of the manufacturer. Therefore the manufacturer does not assume responsibility for any adverse events which may occur in the handling, storage, application, use, misuse or disposal of the product and, so far as permitted by applicable law, the manufacturer expressly disclaims liability for any and all loss, damages and/or expenses arising out of or in any way connected to the storage, handling, use or disposal of the product. Safe handling, storage, use and disposal are the responsibility of the users. Users must comply with all applicable health and safety laws.

Unless we have agreed to the contrary, all products are supplied by us subject to our standard terms and conditions of business, which include limitations of liability. Please make sure to refer to these and / or the relevant agreement which you have with AkzoNobel (or its affiliate, as the case may be).
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The information in this Health & Safety Data Sheet is required pursuant to EC Regulation 1907(2006) and the Chemicals (Hazard Information & Packaging for Supply) Regulations 2009.

Key to 'Comments' column in Section 8.
(+) There is a risk of absorption through unbroken skin.
(C) Capable of causing cancer and/or heritable genetic damage.
(R) Suppliers recommended limit.
(S) Capable of causing occupational asthma.

The full text of the R, H & EUH phrases appearing in section 3 is:

H319 Causes serious eye irritation.

R36 Irritating to eyes.

The following sections have changed since the previous revision.

End of document

Your attention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites : www.yachtpaint.com , www.international-marine.com, www.international-pc.com

Material Safety Data Sheet
INTERPLUS 356 ALUMINUM

Sales Order: {SalesOrd}

Bulk Sales Reference No.:	35601A
MSDS Revision Date:	03/11/2015
MSDS Revision Number:	B0-2

International

1. Identification of the preparation and company

1.1. Product identifier

Product Identity	INTERPLUS 356 ALUMINUM
Bulk Sales Reference No.	35601A

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended Use	See Technical Data Sheet.
Application Method	See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name	International Paint LLC 6001 Antoine Drive Houston Texas 77091

Emergency

CHEMTREC (USA)	(800) 424-9300
International Paint	(713) 682-1711
Poison Control Center	(800) 854-6813
Customer Service	
International Paint	(800) 589-1267
Fax No.	(800) 631-7481

2. Hazard identification of the product

2.1. Classification of the substance or mixture

Flam. Liq. 3;H226	Flammable liquid and vapor.
Skin Irrit. 2;H315	Causes skin irritation.
Eye Irrit. 2;H319	Causes serious eye irritation.
Skin Sens. 1;H317	May cause an allergic skin reaction.
Aquatic Chronic 2;H411	Toxic to aquatic life with long lasting effects.

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labelled as follows.

Warning.

H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H411 Toxic to aquatic life with long lasting effects.

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.

P260 Do not breathe mist / vapors / spray.

P261 Avoid breathing dust / fume / gas / mist / vapors / spray.

P262 Do not get in eyes, on skin, or on clothing.

P272 Contaminated work clothing should not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves / eye protection / face protection.

P301+310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P302+352 IF ON SKIN: Wash with soap and water.

P303+361+353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P331 Do NOT induce vomiting.

P333+313 If skin irritation or a rash occurs: Get medical advice/attention.

P337 If eye irritation persists:.

P362 Take off contaminated clothing and wash before reuse.

P363 Wash contaminated clothing before reuse.

P370 In case of fire: Use water spray, fog, or regular foam..

P391 Collect spillage.

P403+233 Store in a well ventilated place. Keep container tightly closed.

P501 Dispose of contents / container in accordance with local / national regulations.

HMIS Rating Health: 2* Flammability: 2 Reactivity: 0

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Talc (*non-asbestiform) CAS Number: 14807-96-6*	10 - 25	----	[1]
Nepheline syenite CAS Number: 0037244-96-5	10 - 25	----	[1]
Petroleum naphtha CAS Number: 0064742-95-6	1.0 - 10	Asp. Tox. 1;H304 Aquatic Chronic 2;H411 (Self Classification)	[1]
Aluminum CAS Number: 0007429-90-5	1.0 - 10	Water react. 2;H261 Pyr. Sol. 1;H250	[1][2]
Epoxy Resin CAS Number: 0025068-38-6	1.0 - 10	Eye Irrit. 2;H319 Skin Irrit. 2;H315 Skin Sens. 1;H317 Aquatic Chronic 2;H411	[1]
PHENOL, POLYMER WITH FORMALDEHYDE, GLYCIDYL ETHER CAS Number: 0028064-14-4	1.0 - 10	Skin Irrit. 2;H315 Eye Irrit. 2;H319 Skin Sens. 1;H317 Aquatic Chronic 2;H411	[1]
Oxirane, mono[(C12-14-alkyloxy)methyl] derivs. CAS Number: 0068609-97-2	1.0 - 10	Skin Irrit. 2;H315 Skin Sens. 1;H317	[1]
1,2,4-Trimethyl benzene CAS Number: 0000095-63-6	1.0 - 10	Flam. Liq. 3;H226 Acute Tox. 4;H332 Eye Irrit. 2;H319 STOT SE 3;H335 Skin Irrit. 2;H315 Aquatic Chronic	[1]

		2;H411	
Propylene glycol monomethyl ether CAS Number: 0000107-98-2	1.0 - 10	Flam. Liq. 3;H226 STOT SE 3;H336	[1][2]
1,3,5-Trimethylbenzene CAS Number: 0000108-67-8	1.0 - 10	Flam. Liq. 3;H226 STOT SE 3;H335 Aquatic Chronic 2;H411	[1]

[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.

*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General	Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Overview	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing.
Inhalation	Harmful if inhaled. Causes nose and throat irritation. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes	Causes severe eye irritation. Avoid contact with eyes.
Skin	Causes skin irritation. May cause allergic skin reaction. May be harmful if absorbed through the skin.
Ingestion	Harmful if swallowed. May cause abdominal pain, nausea, vomiting, diarrhea, or drowsiness.

Chronic effects

5. Fire-fighting measures

5.1. Extinguishing media

CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. CAUTION: For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective. SMALL FIRES: Use dry chemical, CO2, water spray or regular foam. LARGE FIRES: Use water spray, fog, or regular foam. Do not use straight streams. Move containers from fire area if you can do so without risk.

5.2. Special hazards arising from the substance or mixture

HIGHLY FLAMMABLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

ERG Guide No. 128

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed material.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at least 50 meters (150 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet).

7. Handling and storage

7.1. Precautions for safe handling

Handling

Vapors may cause flash fire or ignite explosively.

In Storage

Keep away from heat, sparks and flame.

7.2. Conditions for safe storage, including any incompatibilities

Store between 40-100F (4-38C).

Avoid contact with eyes, skin and clothing.

Strong oxidizing agents.

Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone.

7.3. Specific end use(s)

Close container after each use.

Wash thoroughly after handling.

Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0000095-63-6	1,2,4-Trimethyl benzene	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	25 ppm TWA; 125 mg/m3 TWA
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0000107-98-2	Propylene glycol monomethyl ether	OSHA	150 ppm STEL; 540 mg/m3 STEL
		ACGIH	50 ppm TWA100 ppm STEL
		NIOSH	100 ppm TWA; 360 mg/m3 TWA150 ppm STEL; 540 mg/m3 STEL
		Supplier	No Established Limit
		OHSA, CAN	100 ppm TWA150 ppm STEL
		Mexico	No Established Limit
		Brazil	No Established Limit
0000108-67-8	1,3,5-Trimethylbenzene	OSHA	No Established Limit
		ACGIH	No Established Limit

		NIOSH	25 ppm TWA; 125 mg/m3 TWA
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0007429-90-5	Aluminum	OSHA	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
		ACGIH	1 mg/m3 TWA (respirable fraction)
		NIOSH	10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)
		Supplier	No Established Limit
		OHSA, CAN	1 mg/m3 TWA (respirable)
		Mexico	10 mg/m3 TWA LMPE-PPT (dust)
		Brazil	No Established Limit
0025068-38-6	Epoxy Resin	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0028064-14-4	PHENOL, POLYMER WITH FORMALDEHYDE, GLYCIDYL ETHER	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0037244-96-5	Nepheline syenite	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	10 mg/m3 TWA (total dust)
		Mexico	No Established Limit
		Brazil	No Established Limit
0064742-95-6	Petroleum naphtha	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0068609-97-2	Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
14807-96-6*	Talc (*non-asbestiform)	OSHA	No Established Limit
		ACGIH	No Established Limit

		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit

Health Data

CAS No.	Ingredient	Source	Value
0000095-63-6	1,2,4-Trimethyl benzene	NIOSH	No Established Limit
0000107-98-2	Propylene glycol monomethyl ether	NIOSH	Eye nose
0000108-67-8	1,3,5-Trimethylbenzene	NIOSH	No Established Limit
0007429-90-5	Aluminum	NIOSH	Lung changes that may lead to pulmonary fibrosis; respiratory and skin irritation
0025068-38-6	Epoxy Resin	NIOSH	No Established Limit
0028064-14-4	PHENOL, POLYMER WITH FORMALDEHYDE, GLYCIDYL ETHER	NIOSH	No Established Limit
0037244-96-5	Nepheline syenite	NIOSH	No Established Limit
0064742-95-6	Petroleum naphtha	NIOSH	No Established Limit
0068609-97-2	Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	NIOSH	No Established Limit
14807-96-6*	Talc (*non-asbestiform)	NIOSH	No Established Limit

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000095-63-6	1,2,4-Trimethyl benzene	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0000107-98-2	Propylene glycol monomethyl ether	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0000108-67-8	1,3,5-Trimethylbenzene	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0007429-90-5	Aluminum	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0025068-38-6	Epoxy Resin	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0028064-14-4	PHENOL, POLYMER WITH FORMALDEHYDE, GLYCIDYL ETHER	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0037244-96-5	Nepheline syenite	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0064742-95-6	Petroleum naphtha	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0068609-97-2	Oxirane, mono[(C12-14-alkyloxy)methyl] derivs.	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No

		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
14807-96-6*	Talc (*non-asbestiform)	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

8.2. Exposure controls

Respiratory	Select equipment to provide protection from the ingredients listed in Section 3 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U.S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.
Eyes	Avoid contact with eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Skin	Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Engineering Controls	Depending on the site-specific conditions of use, provide adequate ventilation.
Other Work Practices	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

9. Physical and chemical properties

Appearance	Coloured Liquid
Odour threshold	Not Measured
pH	No Established Limit
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	117 (C) 243 (F)
Flash Point	44 (C) 111 (F)
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: 1 Upper Explosive Limit: No Established Limit
vapor pressure (Pa)	Not Measured
Vapor Density	Heavier than air
Specific Gravity	1.71
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	No Established Limit Not Measured
VOC %	Refer to the Technical Data Sheet or label where information is available.

9.2. Other information

No further information

10. Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

This product is stable and hazardous polymerization will not occur. Not sensitive to mechanical impact. Excessive heat and fumes generation can occur if improperly handled.

10.3. Possibility of hazardous reactions

No data available

10.4. Conditions to avoid

No data available

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

HIGHLY FLAMMABLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

11. Toxicological information

Acute toxicity

NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
Talc (*non-asbestiform) - (14807-96-6*)	No data available	No data available	No data available	No data available
Nepheline syenite - (37244-96-5)	No data available	No data available	No data available	No data available
Petroleum naphtha - (64742-95-6)	6,800.00, Rat - Category: NA	3,400.00, Rabbit - Category: 5	No data available	No data available
Aluminum - (7429-90-5)	No data available	No data available	No data available	No data available
Epoxy Resin - (25068-38-6)	2,000.00, Rat - Category: 4	2,000.00, Rabbit - Category: 4	No data available	No data available
PHENOL, POLYMER WITH FORMALDEHYDE, GLYCIDYL ETHER - (28064-14-4)	2,000.00, Rat - Category: 4	No data available	No data available	No data available
Oxirane, mono[(C12-14-alkyloxy)methyl] derivs. - (68609-97-2)	No data available	No data available	No data available	No data available
1,2,4-Trimethyl benzene - (95-63-6)	3,400.00, Rat - Category: 5	3,160.00, Rabbit - Category: 5	18.00, Rat - Category: 4	No data available
Propylene glycol monomethyl ether - (107-98-2)	5,000.00, Rat - Category: 5	13,000.00, Rabbit - Category: NA	No data available	No data available
1,3,5-Trimethylbenzene - (108-67-8)	No data available	No data available	24.00, Rat - Category: NA	No data available

Item	Category	Hazard
Acute Toxicity (mouth)	Not Classified	Not Applicable
Acute Toxicity (skin)	Not Classified	Not Applicable
Acute Toxicity (inhalation)	Not Classified	Not Applicable
Skin corrosion/irritation	2	Causes skin irritation.

Eye damage/irritation	2	Causes serious eye irritation.
Sensitization (respiratory)	Not Classified	Not Applicable
Sensitization (skin)	1	May cause an allergic skin reaction.
Germ toxicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive Toxicity	Not Classified	Not Applicable
Specific target organ systemic toxicity (single exposure)	Not Classified	Not Applicable
Specific target organ systemic Toxicity (repeated exposure)	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Talc (*non-asbestiform) - (14807-96-6*)	Not Available	Not Available	Not Available
Nepheline syenite - (37244-96-5)	Not Available	Not Available	Not Available
Petroleum naphtha - (64742-95-6)	9.22, Oncorhynchus mykiss	6.14, Daphnia magna	19.00 (72 hr), Selenastrum capricornutum
Aluminum - (7429-90-5)	0.12, Oncorhynchus mykiss	3.50, Daphnia magna	Not Available
Epoxy Resin - (25068-38-6)	3.10, Pimephales promelas	1.40, Daphnia magna	Not Available
PHENOL, POLYMER WITH FORMALDEHYDE, GLYCIDYL ETHER - (28064-14-4)	9.00, Oncorhynchus mykiss	9.00, Daphnia magna	Not Available
Oxirane, mono[(C12-14-alkyloxy)methyl] derivs. - (68609-97-2)	Not Available	Not Available	Not Available
1,2,4-Trimethyl benzene - (95-63-6)	7.72, Pimephales promelas	3.60, Daphnia magna	Not Available
Propylene glycol monomethyl ether - (107-98-2)	1,000.00, Oncorhynchus mykiss	500.00, Daphnia magna	1,000.00 (96 hr), Selenastrum capricornutum
1,3,5-Trimethylbenzene - (108-67-8)	12.52, Carassius auratus	6.00, Daphnia magna	25.00 (48 hr), Scenedesmus subspicatus

12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

13. Disposal considerations

13.1. Waste treatment methods

Do not allow spills to enter drains or watercourses.

Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. Transport information

14.1. UN number UN 1263

14.2. UN proper shipping name PAINT

14.3. Transport hazard class(es)

DOT (Domestic Surface Transportation)		IMO / IMDG (Ocean Transportation)	
DOT Proper Shipping Name	PAINT	IMDG Proper Shipping Name	PAINT
DOT Hazard Class	3	IMDG Hazard Class Sub Class	3 3
UN / NA Number	UN 1263		
DOT Packing Group	III	IMDG Packing Group	III
CERCLA/DOT RQ	2510 gal. / 35842 lbs.	System Reference Code	1

14.4. Packing group III

14.5. Environmental hazards

IMDG Marine Pollutant: Yes (Petroleum naphtha)

14.6. Special precautions for user

Not Applicable

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

15. Regulatory information

Regulatory Overview The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory.

WHMIS Classification B3 D2B

DOT Marine Pollutants (10%):

(No Product Ingredients Listed)

DOT Severe Marine Pollutants (1%):

(No Product Ingredients Listed)

EPCRA 311/312 Chemicals and RQs (>.1%) :

Cumene (5000 lb final RQ; 2270 kg final RQ)

Butanol (5000 lb final RQ; 2270 kg final RQ)

Xylenes (o-, m-, p- isomers) (100 lb final RQ; 45.4 kg final RQ)

EPCRA 302 Extremely Hazardous (>.1%) :

(No Product Ingredients Listed)

EPCRA 313 Toxic Chemicals (>.1%) :

1,2,4-Trimethyl benzene

Aluminum

Cumene

Butanol

Xylenes (o-, m-, p- isomers)

Mass RTK Substances (>1%) :

1,2,4-Trimethyl benzene

Aluminum

Propylene glycol monomethyl ether
1,3,5-Trimethylbenzene

Penn RTK Substances (>1%) :
1,2,4-Trimethyl benzene
Aluminum
Propylene glycol monomethyl ether

Penn Special Hazardous Substances (>.01%) :
(No Product Ingredients Listed)

RCRA Status:
(No Product Ingredients Listed)

N.J. RTK Substances (>1%) :
1,2,4-Trimethyl benzene
Aluminum
Propylene glycol monomethyl ether

N.J. Special Hazardous Substances (>.01%) :
Aluminum
Cumene
Butanol
Propylene glycol monomethyl ether
Quartz
Xylenes (o-, m-, p- isomers)

N.J. Env. Hazardous Substances (>.1%) :
1,2,4-Trimethyl benzene
Aluminum
Cumene
Butanol
Xylenes (o-, m-, p- isomers)

Proposition 65 - Carcinogens (>0%):
Cumene
Benzene, ethyl-
Formaldehyde
Naphthalene
Quartz

Proposition 65 - Female Repro Toxins (>0%):
(No Product Ingredients Listed)

Proposition 65 - Male Repro Toxins (>0%):
(No Product Ingredients Listed)

Proposition 65 - Developmental Toxins (>0%):
(No Product Ingredients Listed)

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H226 Flammable liquid and vapor.
H250 Catches fire spontaneously if exposed to air.
H261 In contact with water releases flammable gas.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.

H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H411 Toxic to aquatic life with long lasting effects.

The following sections have changed since the previous revision.

End of Document

Material Safety Data Sheet
INTERPLUS 356 PART B

Sales Order: {SalesOrd}

Bulk Sales Reference No.:	EPA357
MSDS Revision Date:	10/21/2014
MSDS Revision Number:	A0-2

International.

1. Identification of the preparation and company

1.1. Product identifier

Product Identity	INTERPLUS 356 PART B
Bulk Sales Reference No.	EPA357

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended Use	See Technical Data Sheet.
Application Method	See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name	International Paint LLC 6001 Antoine Drive Houston Texas 77091

Emergency	
CHEMTREC (USA)	(800) 424-9300
International Paint	(713) 682-1711
Poison Control Center	(800) 854-6813
Customer Service	
International Paint	(800) 589-1267
Fax No.	(800) 631-7481

2. Hazard identification of the product

2.1. Classification of the substance or mixture

Flam. Liq. 3;H226	Flammable liquid and vapor.
Acute Tox. 5;H313	May be harmful in contact with skin.
Skin Irrit. 2;H315	Causes skin irritation.
Eye Dam. 1;H318	Causes serious eye damage.
Aquatic Acute 2;H401	Toxic to aquatic life.

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labelled as follows.

Danger.

H226 Flammable liquid and vapor.
H313 May be harmful in contact with skin.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H401 Toxic to aquatic life.

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.

P261 Avoid breathing dust / fume / gas / mist / vapors / spray.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

P280 Wear protective gloves / eye protection / face protection.

P302+352 IF ON SKIN: Wash with soap and water.

P303+361+353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+312 IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.

P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

P310 Immediately call a POISON CENTER or doctor / physician.

P312 Call a POISON CENTER or doctor / physician if you feel unwell.

P340 Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P362 Take off contaminated clothing and wash before reuse.

P370 In case of fire: Use water spray, fog, or regular foam..

P403+233 Store in a well ventilated place. Keep container tightly closed.

P405 Store locked up.

P501 Dispose of contents / container in accordance with local / national regulations.

HMIS Rating Health: 2* Flammability: 3 Reactivity: 0

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Xylenes (o-, m-, p- isomers) CAS Number: 0001330-20-7	25 - 50	Flam. Liq. 3;H226 Acute Tox. 4;H332 Acute Tox. 4;H312 Skin Irrit. 2;H315 Eye Irrit. 2;H319 STOT SE 3;H335 Asp. Tox. 1;H304	[1][2]
Butanol CAS Number: 0000071-36-3	1.0 - 10	Flam. Liq. 3;H226 Acute Tox. 4;H302 STOT SE 3;H335 Skin Irrit. 2;H315 Eye Dam. 1;H318 STOT SE 3;H336	[1][2]
2,4,6-Tri(dimethylaminomethyl)phenol CAS Number: 0000090-72-2	1.0 - 10	Acute Tox. 4;H302 Eye Irrit. 2;H319 Skin Irrit. 2;H315	[1]

[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.

*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General	Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT

induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Overview	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing.
Inhalation	Harmful if inhaled. May cause allergic respiratory reaction. May cause mucous membrane and respiratory tract irritation, tightness of chest, headache, shortness of breath and dry cough. May cause asthma-like symptoms to occur. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes	Causes severe eye irritation. Avoid contact with eyes.
Skin	Causes skin irritation. May be harmful if absorbed through the skin.
Ingestion	Harmful if swallowed. May cause abdominal pain, nausea, vomiting, diarrhea, or drowsiness.
Chronic effects	

5. Fire-fighting measures

5.1. Extinguishing media

CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. CAUTION: For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective. SMALL FIRES: Use dry chemical, CO2, water spray or regular foam. LARGE FIRES: Use water spray, fog, or regular foam. Do not use straight streams. Move containers from fire area if you can do so without risk.

5.2. Special hazards arising from the substance or mixture

HIGHLY FLAMMABLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

ERG Guide No. 128

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed material.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at least 50 meters (150 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet).

7. Handling and storage

7.1. Precautions for safe handling

Handling

Vapors may cause flash fire or ignite explosively.

In Storage

Keep away from heat, sparks and flame.

7.2. Conditions for safe storage, including any incompatibilities

Store between 40-100F (4-38C).

Do not get in eyes, on skin or clothing.

Strong oxidizing agents.

Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone.

7.3. Specific end use(s)

Close container after each use.

Wash thoroughly after handling.

Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0000071-36-3	Butanol	OSHA	100 ppm TWA; 300 mg/m3 TWA50 ppm Ceiling; 150 mg/m3 Ceiling
		ACGIH	20 ppm TWA
		NIOSH	50 ppm Ceiling; 150 mg/m3 Ceiling1400 ppm IDLH (10% LEL)
		Supplier	No Established Limit
		OHSA, CAN	20 ppm TWA
		Mexico	No Established Limit
		Brazil	40 ppm TWA LT; 115 mg/m3 TWA LT
0000090-72-2	2,4,6-Tri(dimethylaminomethyl)phenol	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0001330-20-7	Xylenes (o-, m-, p- isomers)	OSHA	100 ppm TWA; 435 mg/m3 TWA150 ppm STEL; 655 mg/m3 STEL
		ACGIH	100 ppm TWA150 ppm STEL
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	100 ppm TWA150 ppm STEL
		Mexico	100 ppm TWA LMPE-PPT; 435 mg/m3 TWA LMPE-PPT150 ppm STEL [LMPE-CT]; 655 mg/m3 STEL [LMPE-CT]
		Brazil	78 ppm TWA LT; 340 mg/m3 TWA LT

Health Data

CAS No.	Ingredient	Source	Value
0000071-36-3	Butanol	NIOSH	Eye and mucous membrane irritation CNS depression
0000090-72-2	2,4,6-Tri(dimethylaminomethyl)phenol	NIOSH	No Established Limit
0001330-20-7	Xylenes (o-, m-, p- isomers)	NIOSH	Central nervous system depressant; respiratory and eye irritation

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000071-36-3	Butanol	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	

			Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0000090-72-2	2,4,6-Tri(dimethylaminomethyl)phenol	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0001330-20-7	Xylenes (o-, m-, p- isomers)	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: Yes; Group 4: No;

8.2. Exposure controls

Respiratory	Select equipment to provide protection from the ingredients listed in Section 3 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U.S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.
Eyes	Avoid contact with eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Skin	Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Engineering Controls	Depending on the site-specific conditions of use, provide adequate ventilation.
Other Work Practices	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

9. Physical and chemical properties

Appearance	Coloured Liquid
Odour threshold	Not Measured
pH	No Established Limit
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	137 (C) 279 (F)
Flash Point	28 (C) 82 (F)
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: 1 Upper Explosive Limit: No Established Limit
vapor pressure (Pa)	Not Measured
Vapor Density	Heavier than air
Specific Gravity	0.98
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	No Established Limit Not Measured
VOC %	Refer to the Technical Data Sheet or label where information is

available.

9.2. Other information

No further information

10. Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

This product is stable and hazardous polymerization will not occur. Not sensitive to mechanical impact. Excessive heat and fumes generation can occur if improperly handled.

10.3. Possibility of hazardous reactions

No data available

10.4. Conditions to avoid

No data available

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

HIGHLY FLAMMABLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

11. Toxicological information

Acute toxicity

NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
Xylenes (o-, m-, p- isomers) - (1330-20-7)	4,299.00, Rat - Category: 5	1,548.00, Rabbit - Category: 4	20.00, Rat - Category: 4	No data available
Butanol - (71-36-3)	2,292.00, Rat - Category: 5	3,430.00, Rabbit - Category: 5	No data available	No data available
2,4,6-Tri(dimethylaminomethyl)phenol - (90-72-2)	1,200.00, Rat - Category: 4	1,280.00, Rat - Category: 4	No data available	No data available

Item	Category	Hazard
Acute Toxicity (mouth)	Not Classified	Not Applicable
Acute Toxicity (skin)	5	May be harmful in contact with skin.
Acute Toxicity (inhalation)	Not Classified	Not Applicable
Skin corrosion/irritation	2	Causes skin irritation.
Eye damage/irritation	1	Causes serious eye damage.
Sensitization (respiratory)	Not Classified	Not Applicable
Sensitization (skin)	Not Classified	Not Applicable
Germ toxicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive Toxicity	Not Classified	Not Applicable
Specific target organ systemic toxicity (single exposure)	Not Classified	Not Applicable
Specific target organ systemic Toxicity (repeated exposure)	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Xylenes (o-, m-, p- isomers) - (1330-20-7)	3.30, Oncorhynchus mykiss	8.50, Palaemonetes pugio	100.00 (72 hr), Chlorococcales
Butanol - (71-36-3)	1,376.00, Pimephales promelas	1,328.00, Daphnia magna	500.00 (96 hr), Scenedesmus subspicatus
2,4,6-Tri(dimethylaminomethyl)phenol - (90-72-2)	Not Available	Not Available	Not Available

12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

13. Disposal considerations

13.1. Waste treatment methods

Do not allow spills to enter drains or watercourses.

Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. Transport information

14.1. UN number UN 1263

14.2. UN proper shipping name PAINT

14.3. Transport hazard class(es)

DOT (Domestic Surface Transportation)

DOT Proper Shipping Name	PAINT
DOT Hazard Class	3
UN / NA Number	UN 1263
DOT Packing Group	III
CERCLA/DOT RQ	41 gal. / 338 lbs.

IMO / IMDG (Ocean Transportation)

IMDG Proper Shipping Name	PAINT
IMDG Hazard Class	3
Sub Class	3
IMDG Packing Group	III
System Reference Code	2

14.4. Packing group III

14.5. Environmental hazards

IMDG Marine Pollutant: No

14.6. Special precautions for user

Not Applicable

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

15. Regulatory information

Regulatory Overview	The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory.
WHMIS Classification	B2 D2B E

DOT Marine Pollutants (10%):
(No Product Ingredients Listed)

DOT Severe Marine Pollutants (1%):
(No Product Ingredients Listed)

EPCRA 311/312 Chemicals and RQs (>.1%) :

Butanol (5000 lb final RQ; 2270 kg final RQ)

Xylenes (o-, m-, p- isomers) (100 lb final RQ; 45.4 kg final RQ)

EPCRA 302 Extremely Hazardous (>.1%) :
(No Product Ingredients Listed)

EPCRA 313 Toxic Chemicals (>.1%) :

Butanol

Xylenes (o-, m-, p- isomers)

Mass RTK Substances (>1%) :

Butanol

Xylenes (o-, m-, p- isomers)

Penn RTK Substances (>1%) :

Butanol

Xylenes (o-, m-, p- isomers)

Penn Special Hazardous Substances (>.01%) :
(No Product Ingredients Listed)

RCRA Status:
(No Product Ingredients Listed)

N.J. RTK Substances (>1%) :

Butanol

Xylenes (o-, m-, p- isomers)

N.J. Special Hazardous Substances (>.01%) :

Butanol

Xylenes (o-, m-, p- isomers)

N.J. Env. Hazardous Substances (>.1%) :

Butanol

Xylenes (o-, m-, p- isomers)

Proposition 65 - Carcinogens (>0%):
(No Product Ingredients Listed)

Proposition 65 - Female Repro Toxins (>0%):
(No Product Ingredients Listed)

Proposition 65 - Male Repro Toxins (>0%):
(No Product Ingredients Listed)

Proposition 65 - Developmental Toxins (>0%):
(No Product Ingredients Listed)

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health

and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H226 Flammable liquid and vapor.
H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H372 Causes damage to organs through prolonged or repeated exposure.

This is the first revision of this SDS format, changes from previous revision not applicable.

End of Document

Safety Data Sheet

PHZ675

INTERTHANE 990 LIGHT GREY PART A

Version No. 3 **Date Last Revised** 09/06/05

1. Identification of the preparation and company

Preparation/Product Name	INTERTHANE 990 LIGHT GREY PART A
Product Code	PHZ675
HSE Number	
Intended use	See Technical Data Sheet. For professional use only.
Application Method	See Technical Data Sheet.
Company Name	International Paint Stoneygate Lane Felling Gateshead Tyne and Wear NE10 OJY UK
Telephone No.	+44 (0)191 469 6111
Fax No.	+44 (0)191 438 3711
24 hour Emergency Telephone No.	+44 (0)191 469 6111
Official Advisory Body Telephone No.	+44 (0)870 600 6266 For Advice to Doctors & Hospitals only

2. Composition/information on ingredients

This product contains the following substances that present a health hazard within the meaning of the Dangerous Substances Directive 67/548/EEC and the Chemicals (Hazard Information and Packaging for Supply) Regulations 1999 (2) or have occupational exposure limits detailed in EH40.

Ingredient	EINECS	Concentration	Symbol(s)	Risk phrases (*)
1,2,4-trimethylbenzene	202-436-9	2.5 - < 10	Xn,N	R10,R20,R36/37/38,R51-53
1,3,5-trimethylbenzene	203-604-4	1 - < 2.5	Xi,N	R10, R37, R51-53
1-Methoxy-2-propyl acetate	203-603-9	2.5 - < 10	Xi	R10, R36
Ethylbenzene	202-849-4	1 - < 2.5	F,Xn	R11, R20
Solvent naphtha (petroleum), light aromatic	265-199-0	10 - < 25	Xn,N	R51-53, R65
Xylene	215-535-7	10 - < 25	Xn	R10,R20/21,R38

* The full texts of the phrases are shown in section 16.

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Your a ttention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites : www.yachtpaint.com , www.international-marine.com, www.international-pc.com

3. Hazard identification of the product

Flammable.

Harmful by inhalation.

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Further information is given in section 11.

4. First aid measures

General

In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

Inhalation

Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Eye Contact

Irrigate copiously with clean fresh water for at least 10 minutes, holding the eyelids apart and seek medical attention.

Skin Contact

Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognised skin cleanser. Do NOT use solvents or thinners.

Ingestion

If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

5. Fire-fighting measures

Recommended extinguishing media; alcohol resistant foam, CO^2. powder, water spray.

Do not use; water jet.

Note; Fire will produce dense black smoke. Decomposition products may be hazardous to health. Avoid exposure and use breathing apparatus as appropriate.

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

6. Accidental release measures

Remove sources of ignition, do not turn lights or unprotected electrical equipment on or off. In case of a major spill or spillage in a confined space evacuate the area and check that solvent vapour levels are below the Lower Explosive Limit before re-entering.

Ventilate the area and avoid breathing vapours. Take the personal protective measures listed in section 8.

Contain and absorb spillage with non-combustible materials e.g. sand, earth, vermiculite. Place in closed containers outside buildings and dispose of according to the Waste Regulations. (See section 13).

Clean, preferably with a detergent. Do not use solvents.

Do not allow spills to enter drains or watercourses.

If drains, sewers, streams or lakes are contaminated, inform the local water company immediately. In the case of contamination of rivers, streams or lakes the Environmental Protection Agency should also be informed.

Safety Data Sheet

PHZ675

INTERTHANE 990 LIGHT GREY PART A

Version No. 3 **Date Last Revised** 09/06/05

7. Handling and storage

Handling

This coating contains solvents. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Areas of storage, preparation and application should be ventilated to prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the occupational exposure limits.

In Storage

Handle containers carefully to prevent damage and spillage.

Naked flames and smoking should not be permitted in storage areas. It is recommended that fork lift trucks and electrical equipment are protected to the appropriate standard.

In Use

Avoid skin and eye contact. Avoid inhalation of vapours and spray mists. Observe label precautions. Use personal protection as shown in section 8.

Smoking, eating and drinking should be prohibited in all preparation and application areas.

Never use pressure to empty a container; containers are not pressure vessels.

All sources of ignition (hot surfaces, sparks, open flames etc) should be excluded from areas of preparation and application. All electrical equipment (including torches) should be protected (Ex) to the appropriate standard.

The product may charge electrostatically. Always use earthing leads when pouring solvents and transferring product. Operators should wear clothing which does not generate static (at least 60% natural fibre) and antistatic footwear; floors should be of conducting type.

Activities such as sanding, burning off etc. of paint films may generate dust and/or fumes hazardous to the skin and lungs. Work in well ventilated areas. Use local exhaust ventilation and personal skin and respiratory protective equipment as appropriate.

Storage

Store in a well ventilated, dry place away from sources of heat and direct sunlight.

Store on concrete or other impervious floor, preferably with bunding to contain any spillage. Do not stack more than 3 pallets high.

Keep container tightly closed. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in the original container or one of the same material.

Prevent unauthorised access.

Safety Data Sheet

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INTERTHANE 990 LIGHT GREY PART A

Version No. 3 **Date Last Revised** 09/06/05

8. Exposure controls and personal protection

Engineering Measures

Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapour below occupational exposure limits suitable respiratory protection must be worn.

Exposure Limits

The following occupational exposure limits have been established by the Health and Safety Executive as published in EH40.

Material	Short term (15 min. ave)		Long term (8hr time weighted average)		
	ppm	mg/m³	ppm	mg/m³	
1,2,4-trimethylbenzene			25	125	S
1,3,5-trimethylbenzene			25	125	S
1-Methoxy-2-propyl acetate	100	548	50	274	S +
Ethylbenzene	125	552	100	441	S +
Xylene	100	441	50	220	S +

(M) Maximum Exposure Limit
(S) Occupational Exposure Standard
(R) Suppliers Recommended Limit
(+) There is a risk of absorption through unbroken skin.

Personal Protection

Respiratory Protection

If workers are exposed to concentrations above the exposure limit they must use the appropriate, certified respirators. When spraying this product use a respiratory mask with charcoal and dust filters (as filter combination A2-P2). In confined spaces use compressed air or fresh air respiratory equipment.

Eye Protection

Wear safety eyewear, e.g. safety spectacles, goggles or visors to protect against the splash of liquids. Eyewear should comply with British Standard 2092.

Hand Protection

Nitrile rubber gloves should be worn during mixing and application.

Skin Protection

Overalls which cover the body, arms and legs should be worn. Skin should not be exposed. Barrier creams may help to protect areas which are difficult to cover such as the face and neck. They should however not be applied once exposure has occurred. Petroleum jelly based types such as Vaseline should not be used. All parts of the body should be washed after contact.

AKZO NOBEL

Your a ttention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites : www.yachtpaint.com , www.international-marine.com, www.international-pc.com

9. Physical and chemical properties

Physical State	Liquid
Flash Point (deg C)	34
Viscosity (cSt)	224
Specific Gravity	1.2
Vapour Density	Heavier than air.
Lower Explosive Limit	0.8
Solubility in Water	Immiscible
R.A.Q. to ventilate to 10% of the LEL (m^3/l)	109

10. Stability and reactivity

Stable under recommended storage and handling conditions (see section 7). When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide, carbon dioxide, oxides of nitrogen and smoke.

Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid possible exothermic reactions.

11. Toxicological information

There are no data available on the product itself.

Exposure to solvent vapour concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage.

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INTERTHANE 990 LIGHT GREY PART A

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12. Ecological information

There are no data available on the product itself.

The product should not be allowed to enter drains or water courses.

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is classified for eco-toxicological properties accordingly. See Sections 2 and 15 for details

13. Disposal considerations

Do not allow into drains or water courses. Wastes and empty containers should be disposed of in accordance with regulations made under the Control of Pollution Act and the Environmental Protection Act.

Using information provided in this data sheet advice should be obtained from the Waste Regulation Authority, whether the special waste regulations apply.

European Waste Catalogue Number

08 01 11 Waste paint and varnish containing organic solvents or other dangerous substances

14. Transport information

Transport only in accordance with the following regulations:

ADR/RID UN1263 Paint, 3, III

IMDG	Class	3	Subsidiary Class
	Proper Shipping Name	Paint	
	UN No	1263	
	Ems	F-E,S-E	
	Packaging Group	III	
	Marine Pollutant	Yes	
ICAO/IATA	Shipping Name	Paint	
	Class	3	
	UN No	1263	
	Packaging Group	III	

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Safety Data Sheet

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INTERTHANE 990 LIGHT GREY PART A

Version No. 3 **Date Last Revised** 09/06/05

15. Regulatory information

In accordance with EC Directive 88/379/EEC and the Chemicals (Hazard Information and Packaging for Supply) Regulations SI /3247/1994 this product is labelled as follows:

Symbol(s)

Harmful

Contains;

R. Phrases;

Flammable.

Harmful by inhalation.

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S. Phrases;

Do not breathe vapour/spray.

Avoid contact with skin.

Wear eye/face protection.

Use only in well-ventilated areas.

P. Phrases;

Your a ttention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites : www.yachtpaint.com , www.international-marine.com, www.international-pc.com

Safety Data Sheet

PHZ675

INTERTHANE 990 LIGHT GREY PART A

Version No. 3 **Date Last Revised** 09/06/05

16. Other information

The information on this MSDS is based upon the present state of our knowledge and on current EEC and national laws.

The product should not be used for purposes other than shown in the product data sheet without first obtaining written advice.

It is always the responsibility of the user to take all necessary steps to meet the demands of applicable legislation.

The information in this Health & Safety Data Sheet is required pursuant to Directive 91/155/EEC and the Chemicals (Hazard Information & Packaging for Supply) Regulations 1994.

The full text of the R phrases appearing in section 2 is:

R10 Flammable.

R11 Highly flammable.

R20 Harmful by inhalation.

R20/21 Harmful by inhalation and in contact with skin.

R36 Irritating to eyes.

R36/37/38 Irritating to eyes, respiratory system and skin.

R37 Irritating to respiratory system.

R38 Irritating to skin.

R51-53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R65 Harmful: May cause lung damage if swallowed.

Your a ttention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites : www.yachtpaint.com , www.international-marine.com, www.international-pc.com

Safety Data Sheet

EAF684

INTERZONE 954 SURF GREY PART A

Version No: 1 **Revision Date:** 24/09/02

1. Identification of the preparation and company

Preparation/Product Name	INTERZONE 954 SURF GREY PART A
Product Code	EAF684
HSE Number	
Intended use	See Technical Data Sheet. For professional use only.
Application Method	See Technical Data Sheet.
Company Name	International Paint Stoneygate Lane Felling Gateshead Tyne and Wear NE10 OJY UK
Telephone No.	+44 (0)191 469 6111
Fax No.	+44 (0)191 438 3711
24 hour Emergency Telephone No.	+44 (0)191 469 6111
Official Advisory Body Telephone No.	+44 (0)870 600 6266 For Advice to Doctors & Hospitals only

2. Composition/information on ingredients

This product contains the following substances that present a health hazard within the meaning of the Dangerous Substances Directive 67/548/EEC and the Chemicals (Hazard Information and Packaging for Supply) Regulations 1999 (2) or have occupational exposure limits detailed in EH40.

Ingredient	EINECS	Concentration Label	Symbol(s)	Risk phrases (*)
3-Glycidyloxypropyl-trimethoxysilane	-	01-02.5	n	R22,R36,R43
4-methylpentan-2-one	203-550-1	01-02.5	n	R20,R36/37,R66
Epoxy resin (av.mol.wt. 700)	500-033-5	10-25	i,N	R36/38, R43, R51-53
ylene	215-535-7	10-25	n	R20/21, R38

The full texts of the phrases are shown in section 16.

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Your attention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites: www.yachtpaint.com, www.international-marine.com, www.international-pc.com

3. Hazard identification of the product

Flammable.
Irritating to eyes and skin.
May cause sensitisation by skin contact.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Further information is given in section 11.

4. First aid measures

General
In all cases of doubt, or when symptoms persist, seek medical attention.

Never give anything by mouth to an unconscious person.

Inhalation
Remove to fresh air, keep patient warm and at rest. If breathing is irregular or stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention. Give nothing by mouth.

Eye Contact
Irrigate copiously with clean fresh water for at least 10 minutes, holding the eyelids apart and seek medical attention.

Skin Contact
Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognised skin cleanser. Do NOT use solvents or thinners.

Ingestion
If accidentally swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

5. Fire-fighting measures

Recommended extinguishing media; alcohol resistant foam, CO . powder, water spray.

Do not use; water jet.

Note; Fire will produce dense black smoke. Decomposition products may be hazardous to health. Avoid exposure and use breathing apparatus as appropriate.

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

6. Accidental release measures

Remove sources of ignition, do not turn lights or unprotected electrical equipment on or off. In case of a major spill or spillage in a confined space evacuate the area and check that solvent vapour levels are below the Lower Explosive Limit before re-entering.

Ventilate the area and avoid breathing vapours. Take the personal protective measures listed in section 8.

Contain and absorb spillage with non-combustible materials e.g. sand, earth, vermiculite. Place in closed containers outside buildings and dispose of according to the Waste Regulations. (See section 13).

Clean, preferably with a detergent. Do not use solvents.

Do not allow spills to enter drains or watercourses.

If drains, sewers, streams or lakes are contaminated, inform the local water company immediately. In the case of contamination of rivers, streams or lakes the Environmetal Protection Agency should also be informed.

7. Handling and storage

Handling

This coating contains solvents. Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Areas of storage, preparation and application should be ventilated to prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentrations higher than the occupational exposure limits.

In Storage

Handle containers carefully to prevent damage and spillage.

Naked flames and smoking should not be permitted in storage areas. It is recommended that fork lift trucks and electrical equipment are protected to the appropriate standard.

In Use

Avoid skin and eye contact. Avoid inhalation of vapours and spray mists. Observe label precautions. Use personal protection as shown in section 8.

Smoking, eating and drinking should be prohibited in all preparation and application areas.

Never use pressure to empty a container; containers are not pressure vessels.

All sources of ignition (hot surfaces, sparks, open flames etc) should be excluded from areas of preparation and application. All electrical equipment (including torches) should be protected (Ex) to the appropriate standard.

The product may charge electrostatically. Always use earthing leads when pouring solvents and transferring product. Operators should wear clothing which does not generate static (at least 60% natural fibre) and antistatic footwear; floors should be of conducting type.

Good housekeeping standards and regular safe removal of waste materials will minimise the risks of spontaneous combustion and other fire hazards.

Storage

Store in a well ventilated, dry place away from sources of heat and direct sunlight.

Store on concrete or other impervious floor, preferably with bunding to contain any spillage. Do not stack more than 3 pallets high.

Keep container tightly closed. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in the original container or one of the same material.

Prevent unauthorised access.

The requirements of the Highly Flammable Liquids and Liquified Petroleum Gases Regulations apply if the flashpoint is between 21°C and 32°C.

8. Exposure controls and personal protection

Engineering Measures

Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapour below occupational exposure limits suitable respiratory protection must be worn.

Exposure Limits

The following occupational exposure limits have been established by the Health and Safety Executive as published in EH40.

Material	Short term (15 min. ave)		Long term (8hr time weighted average)		
	ppm	mg/m³	ppm	mg/m³	
4-methylpentan-2-one	100	416	50	208	S +
ylene	100	441	50	220	S +

(M) Maximum Exposure Limit
(S) Occupational Exposure Standard
(R) Suppliers Recommended Limit
(+) There is a risk of absorption through unbroken skin.

Personal Protection

Respiratory Protection

When concentrations exceed the exposure limits shown above workers must wear appropriate respirators approved in accordance with Directive 89/656/EEC and the Personal Protection Equipment Regulations.

Eye Protection

Wear safety eyewear, e.g. safety spectacles, goggles or visors to protect against the splash of liquids. Eyewear should comply with British Standard 2092.

Hand Protection

Nitrile rubber gloves should be worn during mixing and application.

Skin Protection

Overalls which cover the body, arms and legs should be worn. Skin should not be exposed. Barrier creams may help to protect areas which are difficult to cover such as the face and neck. They should however not be applied once exposure has occurred. Petroleum jelly based types such as Vaseline should not be used. All parts of the body should be washed after contact.

AKZO NOBEL Your attention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites: www.yachtpaint.com , www.international-marine.com, www.international-pc.com

Safety Data Sheet

EAF684

INTERZONE 954 SURF GREY PART A

Version No: 1 **Revision Date:** 24/09/02

9. Physical and chemical properties

Physical State	Liquid
Flash Point (deg C)	30
Viscosity (cSt)	-
Specific Gravity	1.775
Vapour Density	Heavier than air.
Lower Explosive Limit	0.6
Solubility in Water	Immiscible
R.A.Q. to ventilate to 10% of the LEL (m ³/l)	72

10. Stability and reactivity

Stable under recommended storage and handling conditions (see section 7). When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide, carbon dioxide, oxides of nitrogen and smoke.

Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid possible exothermic reactions.

11. Toxicological information

There are no data available on the product itself.

Exposure to solvent vapour concentrations from the component solvents in excess of the stated occupational exposure limits may result in adverse health effects such as mucous membrane and respiratory system irritation and adverse effects on the kidneys, liver and central nervous system. Symptoms include headache, nausea, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.

Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in dryness, irritation and possible non-allergic contact dermatitis. Solvents may also be absorbed through the skin. Splashes of liquid in the eyes may cause irritation and soreness with possible reversible damage.

Based on the properties of the epoxy constituents and considering toxicological data on similar preparations this preparation may be an irritant and a skin and respiratory sensitiser. Low molecular weight epoxy constituents are irritating to eyes, mucousmembranes and skin. Repeated skin contact may lead to irritation and sensitisation, possibly with cross-sensitisation to other epoxies.

Safety Data Sheet

EAF684

INTERZONE 954 SURF GREY PART A

Version No: 1 **Revision Date:** 24/09/02

12. Ecological information

There are no data available on the product itself.

The product should not be allowed to enter drains or water courses.

13. Disposal considerations

Do not allow into drains or water courses. Wastes and empty containers should be disposed of in accordance with regulations made under the Control of Pollution Act and the Environmental Protection Act.

Using information provided in this data sheet advice should be obtained from the Waste Regulation Authority, whether the special waste regulations apply.

14. Transport information

Transport only in accordance with the follwing regulations:

ADR/RID	1263 Paint, 3, III, ADR		
IMDG	Class/Div	3	Subsidiary Class
	Proper Shipping Name	Paint	
	UN No	1263	MFAG
	Ems	3-05	
	Packaging Group	III	
	Marine Pollutant	No	
ICAO/IATA	Shipping Name	Paint	
	Class	3	
	UN No	1263	
	Packaging Group	III	

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15. Regulatory information

In accordance with EC Directive 88/379/EEC and the Chemicals (Hazard Information and Packaging for Supply) Regulations SI /3247/1994 this product is labelled as follows:

Symbol(s)

Irritant

Contains;

3-Glycidyloxypropyl-trimethoxysilane

Epoxy resin (av.mol.wt. 700)

R. Phrases;

Flammable.

Irritating to eyes and skin.

May cause sensitisation by skin contact.

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S. Phrases;

Do not breathe vapour/spray.

Avoid contact with skin.

Wear suitable gloves.

Use only in well-ventilated areas.

P. Phrases;

Contains epoxy constituents. See information supplied by the manufacturer.

Your attention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites: www.yachtpaint.com, www.international-marine.com, www.international-pc.com

16. Other information

The information on this MSDS is based upon the present state of our knowledge and on current EEC and national laws.

The product should not be used for purposes other than shown in the product data sheet without first obtaining written advice.

It is always the responsibility of the user to take all necessary steps to meet the demands of applicable legislation.

The information in this Health & Safety Data Sheet is required purusant to Directive 91/155/EEC and the Chemicals (Hazard Information & Packaging for Supply) Regulations 1994.

The full text of the R phrases appearing in section 2 is:

R20 Harmful by inhalation.

R20/21 Harmful by inhalation and in contact with skin.

R22 Harmful if swallowed.

R36 Irritating to eyes.

R36/37 Irritating to eyes and respiratory system.

R36/38 Irritating to eyes and skin.

R38 Irritating to skin.

R43 May cause sensitisation by skin contact.

R51-53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R66 Repeated exposure may cause skin dryness or cracking

Your attention is drawn to the disclaimer on the Product Data Sheet which with this Safety Data Sheet and the package labelling comprise an integral information system about this product. Copies of the Product Data Sheet are available from International Paint on request or from our Internet sites: www.yachtpaint.com, www.international-marine.com, www.international-pc.com

Material Safety Data Sheet
INTERZONE 954 COMPONENTE B

Sales Order: {SalesOrd}

Bulk Sales Reference No.:	EAA964
MSDS Revision Date:	10/25/2013
MSDS Revision Number:	A4-2

International.

1. Identification of the preparation and company

1.1. Product identifier

Product Identity	INTERZONE 954 COMPONENTE B
Bulk Sales Reference No.	EAA964

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended Use	See Technical Data Sheet.
Application Method	See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name	International Paint LLC 6001 Antoine Drive Houston Texas 77091

Emergency	
CHEMTREC (USA)	(800) 424-9300
International Paint	(713) 682-1711
Poison Control Center	(800) 854-6813
Customer Service	
International Paint	(800) 589-1267
Fax No.	(800) 631-7481

2. Hazard identification of the product

2.1. Classification of the substance or mixture

Flam. Liq. 3;H226	Flammable liquid and vapor.
Acute Tox. 4;H302	Harmful if swallowed.
Acute Tox. 5;H313	May be harmful in contact with skin.
Acute Tox. 3;H331	Toxic if inhaled.
Skin Corr. 1B;H314	Causes severe skin burns and eye damage.
Eye Dam. 1;H318	Causes serious eye damage.
Skin Sens. 1;H317	May cause an allergic skin reaction.
Aquatic Acute 1;H400	Very toxic to aquatic life.
Aquatic Chronic 3;H412	Harmful to aquatic life with long lasting effects.

2.2. Label elements

Using the Toxicity Data listed in section 11 & 12 the product is labelled as follows.

Danger.

H226 Flammable liquid and vapor.
H302 Harmful if swallowed.

H313 May be harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H331 Toxic if inhaled.
H400 Very toxic to aquatic life.
H412 Harmful to aquatic life with long lasting effects.

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.
P260 Do not breathe mist / vapors / spray.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves / eye protection / face protection.
P301+330+331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P302+352 IF ON SKIN: Wash with soap and water.
P303+361+353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+312 IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.
P305+351+338 IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.
P310 Immediately call a POISON CENTER or doctor / physician.
P311 Call a POISON CENTER or doctor / physician.
P312 Call a POISON CENTER or doctor / physician if you feel unwell.
P333+313 If skin irritation or a rash occurs: Get medical advice/attention.
P340 Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P363 Wash contaminated clothing before reuse.
P370 In case of fire: Use water spray, fog, or regular foam..
P391 Collect spillage.
P403+233 Store in a well ventilated place. Keep container tightly closed.
P405 Store locked up.
P501 Dispose of contents / container in accordance with local / national regulations.

HMIS Rating Health: 3 Flammability: 2 Reactivity: 0

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Benzyl alcohol CAS Number: 0000100-51-6	10 - 25	Acute Tox. 4;H332 Acute Tox. 4;H302	[1]
Isophorone diamine CAS Number: 0002855-13-2	10 - 25	Acute Tox. 4;H312 Acute Tox. 4;H302 Skin Corr. 1B;H314 Skin Sens. 1;H317 Aquatic Chronic 3;H412	[1]
m-Xylene-alpha, alpha'-diamine CAS Number: 0001477-55-0	10 - 25	Acute Tox. 4;H302 Acute Tox. 3;H331 Skin Corr. 1;H314 Skin Sens. 1;H317 Aquatic Chronic 3;H412	[1][2]
Amines, N-tallow alkyltrimethylenedi-, oleates CAS Number: 0061791-53-5	1.0 - 10	Aquatic Acute 1;H400	[1]
2,4,6-Tri(dimethylaminomethyl)phenol CAS Number: 0000090-72-2	1.0 - 10	Acute Tox. 4;H302 Eye Irrit. 2;H319 Skin Irrit. 2;H315	[1]

Methylisobutyl ketone CAS Number: 0000108-10-1	1.0 - 10	Flam. Liq. 2;H225 Acute Tox. 4;H332 Eye Irrit. 2;H319 STOT SE 3;H335	[1][2]

[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.

*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General	Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
Skin	In case of contact, immediately flush skin with soap and plenty of water. Get medical attention immediately.
Ingestion	If swallowed, immediately contact Poison Control Center at 1-800-854-6813. DO NOT induce vomiting unless instructed to do so by medical personnel. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed

Overview	NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Avoid contact with eyes, skin and clothing.
Inhalation	Harmful if inhaled. Causes nose and throat irritation. Vapors may affect the brain or nervous system causing dizziness, headache or nausea.
Eyes	Causes severe eye irritation. Avoid contact with eyes.
Skin	Causes skin irritation. May cause allergic skin reaction. May be harmful if absorbed through the skin.
Ingestion	Harmful if swallowed. May cause abdominal pain, nausea, vomiting, diarrhea, or drowsiness.
Chronic effects	

5. Fire-fighting measures

5.1. Extinguishing media

CAUTION: This product has a very low flashpoint. Use of water spray when fighting fire may be inefficient. CAUTION: For mixtures containing alcohol or polar solvent, alcohol-resistant foam may be more effective. SMALL FIRES: Use dry chemical, CO2, water spray or regular foam. LARGE FIRES: Use water spray, fog, or regular foam. Do not use straight streams. Move containers from fire area if you can do so without risk.

5.2. Special hazards arising from the substance or mixture

HIGHLY FLAMMABLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

5.3. Advice for fire-fighters

Cool closed containers exposed to fire by spraying them with water. Do not allow run off water and contaminants from fire fighting to enter drains or water courses.

ERG Guide No. 128

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

ELIMINATE ALL IGNITION SOURCES (no smoking, flares, sparks or flames in immediate area). Use only non-sparking equipment to handle spilled material and absorbent. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand, or other non-combustible material and transfer to containers. Use non-sparking tools to collect absorbed

material.

6.2. Environmental precautions

Do not allow spills to enter drains or watercourses.

6.3. Methods and material for containment and cleaning up

CALL CHEMTREC at (800)-424-9300 for emergency response. Isolate spill or leak area immediately for at least 50 meters (150 feet) in all directions. Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. LARGE SPILLS: Consider initial downwind evacuation for at least 300 meters (1000 feet).

7. Handling and storage

7.1. Precautions for safe handling

Handling

Vapors may cause flash fire or ignite explosively.

In Storage

Keep away from heat, sparks and flame.

7.2. Conditions for safe storage, including any incompatibilities

Store between 40-100F (4-38C).

Do not get in eyes, on skin or clothing.

Strong oxidizing agents.

Do not smoke. Extinguish all flames and pilot lights, and turn off stoves, heaters, electric motors and other sources of ignition during use and until all vapors are gone.

7.3. Specific end use(s)

Close container after each use.

Wash thoroughly after handling.

Prevent build-up of vapors by opening all windows and doors to achieve cross-ventilation.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0000090-72-2	2,4,6-Tri(dimethylaminomethyl)phenol	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0000100-51-6	Benzyl alcohol	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0000108-10-1	Methylisobutyl ketone	OSHA	100 ppm TWA; 410 mg/m3 TWA75 ppm STEL; 300 mg/m3 STEL
		ACGIH	20 ppm TWA75 ppm STEL
		NIOSH	50 ppm TWA; 205 mg/m3 TWA75 ppm STEL; 300 mg/m3 STEL500 ppm IDLH
		Supplier	No Established Limit
		OHSA, CAN	20 ppm TWA75 ppm STEL

		Mexico	50 ppm TWA LMPE-PPT; 205 mg/m3 TWA LMPE-PPT75 ppm STEL [LMPE-CT]; 307 mg/m3 STEL [LMPE-CT]
		Brazil	No Established Limit
0001477-55-0	m-Xylene-alpha, alpha'-diamine	OSHA	0.1 mg/m3 Ceiling
		ACGIH	0.1 mg/m3 Ceiling
		NIOSH	0.1 mg/m3 Ceiling
		Supplier	No Established Limit
		OHSA, CAN	0.1 mg/m3 Ceiling
		Mexico	No Established Limit
		Brazil	No Established Limit
0002855-13-2	Isophorone diamine	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit
0061791-53-5	Amines, N-tallow alkyltrimethylenedi-, oleates	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit
		OHSA, CAN	No Established Limit
		Mexico	No Established Limit
		Brazil	No Established Limit

Health Data

CAS No.	Ingredient	Source	Value
0000090-72-2	2,4,6-Tri(dimethylaminomethyl)phenol	NIOSH	No Established Limit
0000100-51-6	Benzyl alcohol	NIOSH	No Established Limit
0000108-10-1	Methylisobutyl ketone	NIOSH	Irritation liver
0001477-55-0	m-Xylene-alpha, alpha'-diamine	NIOSH	Skin irritation systemic effects
0002855-13-2	Isophorone diamine	NIOSH	No Established Limit
0061791-53-5	Amines, N-tallow alkyltrimethylenedi-, oleates	NIOSH	No Established Limit

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000090-72-2	2,4,6-Tri(dimethylaminomethyl)phenol	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0000100-51-6	Benzyl alcohol	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0000108-10-1	Methylisobutyl ketone	OSHA	Select Carcinogen: Yes
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: Yes; Group 3: No; Group 4: No;
0001477-55-0	m-Xylene-alpha, alpha'-diamine	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0002855-13-2	Isophorone diamine	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No

		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
0061791-53-5	Amines, N-tallow alkyltrimethylenedi-, oleates	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

8.2. Exposure controls

Respiratory	Select equipment to provide protection from the ingredients listed in Section 3 of this document. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates dust, vapor, or mist levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH approved) during and after application. Follow respirator manufacturer's directions for respirator use. FOR USERS OF 3M RESPIRATORY PROTECTION ONLY: For information and assistance on 3M occupational health and safety products, call OH&ESD Technical Service toll free in U.S.A. 1-800-243-4630, in Canada call 1-800-267-4414. Please do not contact these numbers regarding other manufacturer's respiratory protection products. 3M does not endorse the accuracy of the information contained in this Material Safety Data Sheet.
Eyes	Avoid contact with eyes. Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, safety glasses, chemical goggles, and/or head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Skin	Protective equipment should be selected to provide protection from exposure to the chemicals listed in Section 3 of this document. Depending on the site-specific conditions of use, protective gloves, apron, boots, head and face protection may be required to prevent contact. The equipment must be thoroughly cleaned, or discarded after each use.
Engineering Controls	Depending on the site-specific conditions of use, provide adequate ventilation.
Other Work Practices	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, using toilet facilities, etc. Promptly remove soiled clothing and wash clothing thoroughly before reuse. Shower after work using plenty of soap and water.

9. Physical and chemical properties

Appearance	Coloured Liquid
Odour threshold	Not Measured
pH	No Established Limit
Melting point / freezing point	Not Measured
Initial boiling point and boiling range	79 (C) 175 (F)
Flash Point	44 (C) 111 (F)
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	Lower Explosive Limit: 1.3 Upper Explosive Limit: No Established Limit
vapor pressure (Pa)	Not Measured
Vapor Density	Heavier than air
Specific Gravity	1.02
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	No Established Limit
VOC %	Refer to the Technical Data Sheet or label where information is available.

9.2. Other information

No further information

10. Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

This product is stable and hazardous polymerization will not occur. Not sensitive to mechanical impact. Excessive heat and fumes generation can occur if improperly handled.

10.3. Possibility of hazardous reactions

No data available

10.4. Conditions to avoid

No data available

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

HIGHLY FLAMMABLE MATERIALS: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks) creating a vapor explosion hazard. Runoff to sewers may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water.

11. Toxicological information

Acute toxicity

NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal.

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr
Benzyl alcohol - (100-51-6)	1,230.00, Rat - Category: 4	2,000.00, Rabbit - Category: 4	No data available	4.178, Rat - Category: 4
Isophorone diamine - (2855-13-2)	1,030.00, Rat - Category: 4	2,001.00, Rat - Category: 5	No data available	5.02, Rat - Category: NA
m-Xylene-alpha, alpha'-diamine - (1477-55-0)	930.00, Rat - Category: 4	2,000.00, Rabbit - Category: 4	2.40, Rat - Category: 3	No data available
Amines, N-tallow alkyltrimethylenedi-, oleates - (61791-53-5)	5,000.00, Rat - Category: 5	No data available	No data available	No data available
2,4,6-Tri(dimethylaminomethyl)phenol - (90-72-2)	1,200.00, Rat - Category: 4	1,280.00, Rat - Category: 4	No data available	No data available
Methylisobutyl ketone - (108-10-1)	2,080.00, Rat - Category: 5	16,000.00, Rabbit - Category: NA	12.30, Rat - Category: 4	No data available

Item	Category	Hazard
Acute Toxicity (mouth)	4	Harmful if swallowed.
Acute Toxicity (skin)	5	May be harmful in contact with skin.
Acute Toxicity (inhalation)	3	Toxic if inhaled.
Skin corrosion/irritation	1B	Causes severe skin burns and eye damage.
Eye damage/irritation	1	Causes serious eye damage.
Sensitization (respiratory)	Not Classified	Not Applicable
Sensitization (skin)	1	May cause an allergic skin reaction.
Germ toxicity	Not Classified	Not Applicable
Carcinogenicity	Not Classified	Not Applicable
Reproductive Toxicity	Not Classified	Not Applicable
Specific target organ systemic toxicity (single exposure)	Not Classified	Not Applicable

Specific target organ systemic Toxicity (repeated exposure)	Not Classified	Not Applicable
Aspiration hazard	Not Classified	Not Applicable

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Benzyl alcohol - (100-51-6)	10.00, Lepomis macrochirus	55.00, Daphnia magna	700.00 (72 hr), Algae
Isophorone diamine - (2855-13-2)	110.00, Leuciscus idus	17.40, Daphnia magna	37.00 (72 hr), Scenedesmus subspicatus
m-Xylene-alpha, alpha'-diamine - (1477-55-0)	100.00, Oncorhynchus mykiss	16.00, Daphnia magna	Not Available
Amines, N-tallow alkyltrimethylenedi-, oleates - (61791-53-5)	0.10, Fish (Piscis)	0.001, Daphnia magna	0.01 (72 hr), Algae
2,4,6-Tri(dimethylaminomethyl)phenol - (90-72-2)	Not Available	Not Available	Not Available
Methylisobutyl ketone - (108-10-1)	505.00, Pimephales promelas	1,550.00, Daphnia magna	980.00 (48 hr), Scenedesmus subspicatus

12.2. Persistence and degradability

No data available

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available

13. Disposal considerations

13.1. Waste treatment methods

Do not allow spills to enter drains or watercourses.

Dispose of in accordance with local, state and federal regulations. (Also reference RCRA information in Section 15 if listed).

14. Transport information

14.1. UN number UN 1263

14.2. UN proper shipping name PAINT

14.3. Transport hazard class(es)

DOT (Domestic Surface Transportation)

DOT Proper Shipping Name PAINT

DOT Hazard Class 3

IMO / IMDG (Ocean Transportation)

IMDG Proper Shipping Name PAINT

		IMDG Hazard Class	3
		Sub Class	3
UN / NA Number	UN 1263		
DOT Packing Group	III	IMDG Packing Group	III
CERCLA/DOT RQ	14980 gal. / 127551 lbs.	System Reference Code	2

14.4. Packing group III

14.5. Environmental hazards

IMDG Marine Pollutant: Yes (Amines, N-tallow alkyltrimethylenedi-, oleates)

14.6. Special precautions for user

Not Applicable

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not Applicable

15. Regulatory information

Regulatory Overview The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. All ingredients of this product are listed on the TSCA (Toxic Substance Control Act) Inventory or are not required to be listed on the TSCA Inventory.

WHMIS Classification B3 D2B E

DOT Marine Pollutants (10%):
(No Product Ingredients Listed)

DOT Severe Marine Pollutants (1%):
(No Product Ingredients Listed)

EPCRA 311/312 Chemicals and RQs (>.1%) :
Methylisobutyl ketone (5000 lb final RQ; 2270 kg final RQ)

EPCRA 302 Extremely Hazardous (>.1%) :
(No Product Ingredients Listed)

EPCRA 313 Toxic Chemicals (>.1%) :
Methylisobutyl ketone

Mass RTK Substances (>1%) :
Benzyl alcohol
m-Xylene-alpha, alpha'-diamine
Methylisobutyl ketone

Penn RTK Substances (>1%) :
Benzyl alcohol
m-Xylene-alpha, alpha'-diamine
Methylisobutyl ketone

Penn Special Hazardous Substances (>.01%) :
(No Product Ingredients Listed)

RCRA Status:
(No Product Ingredients Listed)

N.J. RTK Substances (>1%) :
Isophorone diamine
m-Xylene-alpha, alpha'-diamine
Methylisobutyl ketone

N.J. Special Hazardous Substances (>.01%) :
Isophorone diamine
Methylisobutyl ketone

N.J. Env. Hazardous Substances (>.1%) :
Methylisobutyl ketone

Proposition 65 - Carcinogens (>0%):
Methylisobutyl ketone

Proposition 65 - Female Repro Toxins (>0%):
(No Product Ingredients Listed)

Proposition 65 - Male Repro Toxins (>0%):
(No Product Ingredients Listed)
Proposition 65 - Developmental Toxins (>0%):
(No Product Ingredients Listed)

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H225 Highly flammable liquid and vapor.
H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H331 Toxic if inhaled.
H332 Harmful if inhaled.
H335 May cause respiratory irritation.
H400 Very toxic to aquatic life.
H412 Harmful to aquatic life with long lasting effects.

The following sections have changed since the previous revision.

End of Document

SAFETY DATA SHEET

(REACH regulation (EC) n° 1907/2006 - n° 453/2010)

SECTION 1 : IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name : IPA 70/30 - SATWIPES / PROSAT / SOCOSAT

Product code : 29012T.

1.2. Relevant identified uses of the substance or mixture and uses advised against

Solvent

Cleaner

Industrial uses

Professional uses

1.3. Details of the supplier of the safety data sheet

Registered company name : SOCOMORE S.A.S..

Address : Zone Industrielle du Prat - CS 23707.56037.VANNES CEDEX.France.

Telephone : +33 (0)2 97 43 76 83. Fax : +33 (0)2 97 54 50 26.

techdirsocomore@socomore.com

Distributor: Socomore Ltd - 5, Coe Avenue – Loughborough - Leicestershire – LE11 4SE - UK - Tel: + 44 1509 262040 - Fax + 44 1509 262046

Distributor: Socomore GmbH - c/o MAZARS GmbH - Bernhard-Wicki-Straße 7 - 80636 München - Deutschland Tel. +49 (0) 89 88 91 98 15 Fax. +49 (0) 89 88 91 98 16

Distributor: Socomore Iberia - Calle Diputació, 260 - 08007 Barcelona - España - Tel. +34 93 573 82 60 - Fax +34 902 908 966

Distributor: MagChem Inc. 1271, rue Ampère, suite 101, Boucherville, QC, J4B 5Z5 Canada - tel: 1-450 641 8500 - fax: 1-450 655 1717

Distributor: Socomore Trading Shanghai - 355 East Kang Qiao Road - Kang Qiao Industrial Zone - Pudong - 201315 Shanghai - Tel. 862158131133 / Fax. 862158131933

Dystrybutor : SOCOMORE SPzoo - Ul. Piekna 18, 00-549 Warszawa Polska Tel +48 (22) 621 65 68 Fax +48 (22) 621 61 09

1.4. Emergency telephone number : +33 (0)1 45 42 59 59.

Association/Organisation : INRS.

SECTION 2 : HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

In compliance with directives 67/548/EEC, 1999/45/EC and their amendments.

Highly flammable.

Possibility of irritation to the eyes.

Vapors may cause drowsiness and dizziness.

This mixture does not present an environmental hazard. No known or foreseeable environmental damage under standard conditions of use.

2.2. Label elements

Detergent mixture (see section 15).

In compliance with directives 67/548/EEC, 1999/45/EC and their amendments.

Hazard symbols :

Irritant

Highly flammable

Risk phrase :

R 36	Irritating to eyes.
R 11	Highly flammable.
R 67	Vapours may cause drowsiness and dizziness.

Safety phrase :

S 16	Keep away from sources of ignition - No smoking.
S 26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 60	This material and its container must be disposed of as hazardous waste.
S 9	Keep container in a well-ventilated place.
S 37	Wear suitable gloves.

2.3. Other hazards

No data available.

SECTION 3 : COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

No substances fulfil the criteria set forth in annexe II section A of the REACH regulation (EC) n° 1907/2006.

3.2. Mixtures

Composition :

Identification	(EC) 1272/2008	67/548/EEC	Note	%
INDEX: 603-117-00-0 CAS: 67-63-0 EC: 200-661-7 REACH: 01-2119457558-25 PROPAN-2-OL	GHS02, GHS07 Dgr Flam. Liq. 2, H225 Eye Irrit. 2, H319 STOT SE 3, H336	Xi,F Xi;R36 F;R11 R67	[1]	50 <= x % < 100

Information on ingredients :

[1] Substance for which maximum workplace exposure limits are available.

SECTION 4 : FIRST AID MEASURES

As a general rule, in case of doubt or if symptoms persist, always call a doctor.

NEVER induce swallowing by an unconscious person.

4.1. Description of first aid measures

In the event of exposure by inhalation :

In the event of massive inhalation of dust, remove the person exposed to fresh air. Keep warm and at rest.

In the event of splashes or contact with eyes :

Wash thoroughly with soft, clean water for 15 minutes holding the eyelids open.

If there is any redness, pain or visual impairment, consult an ophthalmologist.

In the event of splashes or contact with skin :

Watch out for any remaining product between skin and clothing, watches, shoes, etc.

In the event of swallowing :

In the event of swallowing, if the quantity is small (no more than one mouthful), rinse the mouth with water and consult a doctor.

Keep the person exposed at rest. Do not force vomiting.

Seek medical attention, showing the label.

If swallowed accidentally, call a doctor to ascertain whether observation and hospital care will be necessary. Show the label.

4.2. Most important symptoms and effects, both acute and delayed

No data available.

4.3. Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5 : FIREFIGHTING MEASURES

Flammable.

Chemical powders, carbon dioxide and other extinguishing gas are suitable for small fires.

5.1. Extinguishing media

Keep packages cool when in the vicinity of flames.

Suitable methods of extinction

In the event of a fire, use :

- sprayed water or water mist
- water with AFFF (Aqueous Film Forming Foam) additive
- halon
- foam
- multipurpose ABC powder
- BC powder
- carbon dioxide (CO2)

Prevent the effluent of fire-fighting measures from entering drains or waterways.

Unsuitable methods of extinction

In the event of a fire, do not use :

- water jet

5.2. Special hazards arising from the substance or mixture

A fire will often produce a thick black smoke. Exposure to decomposition products may be hazardous to health.

Do not breathe in smoke.

In the event of a fire, the following may be formed :

- carbon monoxide (CO)
- carbon dioxide (CO2)

5.3. Advice for firefighters

Fire-fighting personnel are to be equipped with autonomous insulating breathing apparatus.

SECTION 6 : ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Consult the safety measures listed under headings 7 and 8.

For non fire-fighters

Because of the organic solvents contained in the mixture, eliminate sources of ignition and ventilate the area.

Avoid any contact with the skin and eyes.

Avoid inhaling dust.

For fire-fighters

Fire-fighters will be equipped with suitable personal protective equipment (See section 8).

6.2. Environmental precautions

Contain and control the leaks or spills with non-combustible absorbent materials such as sand, earth, vermiculite, diatomaceous earth in drums for waste disposal.

Prevent any material from entering drains or waterways.

6.3. Methods and material for containment and cleaning up

Retrieve the product by mechanical means (sweeping/vacuuming).

6.4. Reference to other sections

No data available.

SECTION 7 : HANDLING AND STORAGE

Requirements relating to storage premises apply to all facilities where the mixture is handled.

7.1. Precautions for safe handling

Always wash hands after handling.

Remove and wash contaminated clothing before re-using.

Ensure that there is adequate ventilation, especially in confined areas.

Fire prevention :

Handle in well-ventilated areas.

Vapours are heavier than air. They can spread along the ground and form mixtures that are explosive with air.

Prevent the formation of flammable or explosive concentrations in air and avoid vapor concentrations higher than the occupational exposure limits.

Prevent the accumulation of electrostatic charges with connections to earth.

The mixture can become electrostatically charged : always earth during decanting operations. Wear antistatic shoes and clothing and floors should be electrically conductive.

Use the mixture in premises free of naked flames or other sources of ignition and ensure that electrical equipment is suitably protected.

Keep packages tightly closed and away from sources of heat, sparks and naked flames.

Do not use tools which may produce sparks. Do not smoke.

Prevent access by unauthorised personnel.

Recommended equipment and procedures :

For personal protection, see section 8.

Observe precautions stated on label and also industrial safety regulations.

Avoid eye contact with this mixture.

Packages which have been opened must be reclosed carefully and stored in an upright position.

Prohibited equipment and procedures :

No smoking, eating or drinking in areas where the mixture is used.

7.2. Conditions for safe storage, including any incompatibilities

No data available.

Storage

Keep the container tightly closed in a dry, well-ventilated place.

Keep away from all sources of ignition - do not smoke.

Keep well away from all sources of ignition, heat and direct sunlight

Avoid accumulation of electrostatic charges.

The floor must be impermeable and form a collecting basin so that, in the event of an accidental spillage, the liquid cannot spread beyond this area.

Packaging

Always keep in packaging made of an identical material to the original.

7.3. Specific end use(s)

No data available.

SECTION 8 : EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Occupational exposure limits :

- ACGIH TLV (American Conference of Governmental Industrial Hygienists, Threshold Limit Values, 2010) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
67-63-0	200 ppm	400 ppm	-	-	-

- Germany - AGW (BAuA - TRGS 900, 21/06/2010) :

CAS	VME :	VME :	Excess	Notes

67-63-0	200 ml/m3	500 mg/m3	2(II)	DFG, Y	

- France (INRS - ED984 :2008) :

CAS	VME-ppm :	VME-mg/m3 :	VLE-ppm :	VLE-mg/m3 :	Notes :	TMP No :
67-63-0	-	-	400	980	-	84

- UK / WEL (Workplace exposure limits, EH40/2005, 2007) :

CAS	TWA :	STEL :	Ceiling :	Definition :	Criteria :
67-63-0	400 ppm	500 ppm	-	-	-

8.2. Exposure controls

Personal protection measures, such as personal protective equipment

Pictogram(s) indicating the obligation of wearing personal protective equipment (PPE) :

Use personal protective equipment that is clean and has been properly maintained.

Store personal protective equipment in a clean place, away from the work area.

Never eat, drink or smoke during use. Remove and wash contaminated clothing before re-using. Ensure that there is adequate ventilation, especially in confined areas.

- Eye / face protection

Avoid contact with eyes.

Use eye protectors designed to protect against liquid splashes

Before handling, wear safety goggles with protective sides accordance with standard EN166.

In the event of high danger, protect the face with a face shield.

Before handling powders or dust emission, wear mask goggles in accordance with standard EN166.

Prescription glasses are not considered as protection.

Individuals wearing contact lenses should wear prescription glasses during work where they may be exposed to irritant vapours.

Provide eyewash stations in facilities where the product is handled constantly.

- Hand protection

Use suitable protective gloves that are resistant to chemical agents in accordance with standard EN374.

Gloves must be selected according to the application and duration of use at the workstation.

Protective gloves need to be selected according to their suitability for the workstation in question : other chemical products that may be handled, necessary physical protections (cutting, pricking, heat protection), level of dexterity required.

Type of gloves recommended :

- Nitrile rubber (butadiene-acrylonitrile copolymer rubber (NBR))

Recommended properties :

- Impervious gloves in accordance with standard EN374

- Body protection

Work clothing worn by personnel shall be laundered regularly.

After contact with the product, all parts of the body that have been soiled must be washed.

- Respiratory protection

Avoid breathing vapours.

Avoid breathing dust.

If the ventilation is insufficient, wear appropriate breathing apparatus.

When workers are confronted with concentrations that are above occupational exposure limits, they must wear a suitable, approved, respiratory protection device.

Type of FFP mask :

Wear a disposable half-mask dust filter in accordance with standard EN149.

Category :

- FFP1

Anti-gas and vapour filter(s) (Combined filters) in accordance with standard EN14387 :

- A1 (Brown)

SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

General information :

Physical state :	solid.

Important health, safety and environmental information

	neutral.
pH :	Not stated.
Boiling point/boiling range :	82 °C.
Flash Point :	17.00 °C.
Vapour pressure (50°C) :	not relevant.
Density :	< 1
Water solubility :	Soluble.
Melting point/melting range :	not relevant.
Self-ignition temperature :	not specified.
Decomposition point/decomposition range :	not relevant.

9.2. Other information

VOC (g/l) : 602

No data available.

SECTION 10 : STABILITY AND REACTIVITY

10.1. Reactivity

No data available.

10.2. Chemical stability

This mixture is stable under the recommended handling and storage conditions in section 7.

10.3. Possibility of hazardous reactions

When exposed to high temperatures, the mixture can release hazardous decomposition products, such as carbon monoxide and dioxide, fumes and nitrogen oxide.

10.4. Conditions to avoid

Any apparatus likely to produce a flame or to have a metallic surface at high temperature (burners, electric arcs, furnaces etc.) must not be allowed on the premises.

Avoid :

- accumulation of electrostatic charges.
- heating
- heat
- flames and hot surfaces
- formation of dusts

Dusts can form an explosive mixture with air.

10.5. Incompatible materials

Keep away from :

- combustible material

10.6. Hazardous decomposition products

The thermal decomposition may release/form :

- carbon monoxide (CO)
- carbon dioxide (CO2)

SECTION 11 : TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Repeated or prolonged contact with the mixture may cause removal of natural oil from the skin resulting in non-allergic contact dermatitis and absorption through the skin.

May have reversible effects on the eyes, such as eye irritation which is totally reversible by the end of observation at 21 days.

Splashes in the eyes may cause irritation and reversible damage

Narcotic effects may occur, such as drowsiness, narcosis, decreased alertness, loss of reflexes, lack of coordination or dizziness.

Effects may also occur in the form of violent headaches or nausea, judgement disorder, giddiness, irritability, fatigue or memory disturbance.

11.1.1. Substances

No toxicological data available for the substances.

11.1.2. Mixture

No toxicological data available for the mixture.

SECTION 12 : ECOLOGICAL INFORMATION

12.1. Toxicity

12.1.1. Substances

No aquatic toxicity data available for the substances.

12.1.2. Mixtures

No aquatic toxicity data available for the mixture.

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulative potential

No data available.

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

No data available.

12.6. Other adverse effects

No data available.

SECTION 13 : DISPOSAL CONSIDERATIONS

Proper waste management of the mixture and/or its container must be determined in accordance with Directive 2008/98/EC.

13.1. Waste treatment methods

Do not pour into drains or waterways.

Waste :

Waste management is carried out without endangering human health, without harming the environment and, in particular without risk to water, air, soil, plants or animals.

Recycle or dispose of waste in compliance with current legislation, preferably via a certified collector or company.

Do not contaminate the ground or water with waste, do not dispose of waste into the environment.

Soiled packaging :

Empty container completely. Keep label(s) on container.

Give to a certified disposal contractor.

Codes of wastes (Decision 2001/573/EC, Directive 2006/12/EEC, Directive 94/31/EEC on hazardous waste) :

15 02 02 * absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances

SECTION 14 : TRANSPORT INFORMATION

Transport product in compliance with provisions of the ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport (ADR 2013 - IMDG 2012 - ICAO/IATA 2013).

14.1. UN number

3175

14.2. UN proper shipping name

UN3175=SOLIDS or mixtures of solids (such as preparations and wastes) CONTAINING FLAMMABLE LIQUID, N.O.S. having a flash-point up to 60 °C

(propan-2-ol)

14.3. Transport hazard class(es)

- Classification :

4.1

14.4. Packing group

II

14.5. Environmental hazards

-

14.6. Special precautions for user

ADR/RID	Class	Code	Pack gr.	Label	Ident.	LQ	Provis.	EQ	Cat.	Tunnel
	4.1	F1	II	4.1	40	1 kg	216 274 601	E2	2	E

IMDG	Class	2°Label	Pack gr.	LQ	EMS	Provis.	EQ
	4.1	-	II	1 kg	F-A,S-I	216 274	E2

IATA	Class	2°Label	Pack gr.	Passager	Passager	Cargo	Cargo	note	EQ
	4.1	-	II	445	15 kg	448	50 kg	A46	E2
	4.1	-	II	Y441	5 kg	-	-	A46	E2

For limited quantities, see part 2.7 of the OACI/IATA and chapter 3.4 of the ADR and IMDG.

For excepted quantities, see part 2.6 of the OACI/IATA and chapter 3.5 of the ADR and IMDG.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available.

SECTION 15 : REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

- Particular provisions :

No data available.

15.2. Chemical safety assessment

No data available.

SECTION 16 : OTHER INFORMATION

Since the user's working conditions are not known by us, the information supplied on this safety data sheet is based on our current level of knowledge and on national and community regulations.

The mixture must not be used for other uses than those specified in section 1 without having first obtained written handling instructions.

It is at all times the responsibility of the user to take all necessary measures to comply with legal requirements and local regulations.

The information in this safety data sheet must be regarded as a description of the safety requirements relating to the mixture and not as a guarantee of the properties thereof.

Title for H, EUH and R indications mentioned in section 3 :

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
R 11	Highly flammable.
R 36	Irritating to eyes.
R 67	Vapours may cause drowsiness and dizziness.

Abbreviations :

ADR : European agreement concerning the international carriage of dangerous goods by Road.

IMDG : International Maritime Dangerous Goods.

IATA : International Air Transport Association.

ICAO : International Civil Aviation Organisation

RID : Regulations concerning the International carriage of Dangerous goods by rail.

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MASTER SAFETY DATA SHEET

Version date:	Version number:	Printing date:	Page:
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MSDS: ID001

10% ISOPROPANOL IN WATER

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION

Product Name 10% ISOPROPANOL IN WATER

Supplier

UNIVAR A/S
ROSENØRNS ALLE 9
DK-1970 FREDERIKSBERG C

Telephone: +45 3537 1244, Fax: +45 3537 5204

IDE-KEMI ApS
Håndværkervej 3 - 7120 Vejle Øst - **Tlf. 75 81 56 22**

2. COMPOSITION/INFORMATION ON INGREDIENTS

CAS number		%	Symbols:
67-63-0	200-661-7 Isopropanol	10	Xi, F **R-phrases** R11-R36-R67

Other information

Please refer to section 16 for wording of R-phrases

3. HAZARDS IDENTIFICATION

R10 FLAMMABLE.

4. FIRST-AID MEASURES

Inhalation: Remove to fresh air
Skin contact: Flush exposed area with water
Eye contact: Flush eyes with large amounts of water. See a doctor if necessary
Ingestion: Do not induce vomiting. See a doctor if considerable amounts has been ingested

5. FIRE-FIGHTING MEASURES

Extinguishing Media: Alcohol-resistent foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires.

Wear self-contained breathing apparatus

Keep adjacent containers cool by spraying with water

6. ACCIDENTAL RELEASE MEASURES

Prevent from spreading by using sand, earth or other appropriate barriers

Transfer liquid by mechanical means to a labelled sealable container for safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely.

Refer to section 8 for appropriate Personal Protective Equipment

7. HANDLING AND STORAGE

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Fax +46 (0)40 -12 91 72

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Only use in well ventilated areas
Take precautions against eletrostatic discharges
Extinguish any naked flames

Storage
Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat.
Keep away from oxidizing agents

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA for Isopropanol (Denmark): 200 ppm

Avoid contact with skin and eyes. Use gloves (butyl rubber) and chemical monogoggles if necessary.

Avoid breathing vapours. Use respiratory protective equipment if necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Liquid

Density, kg/m3	970 (calculated, 25°C)
Water solubility	complete
Flash point, °C	26 (calculated)

10. STABILITY AND REACTIVITY

Stable under normal conditions of use.

Avoid contact with strong oxidising agents and strong acids.

11. TOXICOLOGICAL INFORMATION

Isopropanol:

Skin contact: Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis.
Eye contact: Irritating to the eyes
Inhalation: High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea, continued inhalation may result in unconsciousness and/or death
May cause irritation of the respiratory system
May cause damage to the central nervous system

12. ECOLOGICAL INFORMATION

Isopropanol:

Fish: low toxicity: LC/EC/IC50 > 100 mg/l
Algae: Expected to have low toxicity: LC/EC/IC50 > 100 mg/l
Microorganisms: low toxicity: LC/EC/IC50 > 100 mg/l

Not expected to bioaccumulate significantly
Readily biodegradable

13. DISPOSAL CONSIDERATIONS

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Contact local Authorities. Hazardous waste

14. TRANSPORT INFORMATION

Proper shipping name UN1219 Isopropanol
ISOPROPANOL,10% SOLUTION
Proper shipping name Isopropanol
ISOPROPANOL, 10% SOLUTION
Class/Packaging gr. 3/III
Flash point ca.26

15. REGULATORY INFORMATION

Classification	Symbol / Hazard code
Health hazard	0 : Not hazardous
Environmental hazard	0 : Not hazardous

R- and S-sentences

R10 FLAMMABLE.

Regulatory information

Children and young people are not allowed to work with the product (Denmark)

16. OTHER INFORMATION

R11 HIGHLY FLAMMABLE.
R36 IRRITATING TO EYES.
R67 VAPOURS MAY CAUSE DROWSINESS AND DIZZINESS.

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According to EC-Regulation 1907/2006 (REACH)

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
Strong rust and lime remover
Product no.
-
REACH registration number
Not applicable
Other means of identification

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
High-concentrate special agent for removal of limestone and rust on sanitary porcelain and chromium-plated fittings.
Do not use on terrazzo floors and enamelled objects (bath tubs).
The full text of any mentioned and identified application categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
Borup Kemi I/S
B kg rdsvej 53
DK-4140 Borup
Tlf: +45 5756 0020
Fax: +45 5756 0021
www.borup-kemi.dk
Contact person
-
E-mail
kontakt borup-kemi.dk
SDS date
18-07-2012
SDS Version
1.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Irritant.

2.2. Label elements

Hazard pictogram(s)

Hazard statement(s)
Irritating to eyes and skin. (R36/38)

Identity of the substances primarily responsible for the major health hazards

Safety statement(s)	General	Keep out of the reach of children.
	Prevention	-
	Response	If swallowed, seek medical advice immediately and show this container or label. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
	Storage	-
	Disposal	-

2.3. Other hazards

This product contains an organic solvent. Repeated exposure to organic solvents can result in damage to the nervous system and inner organs, such as the liver and kidneys.

Additional labelling

-

Additional warnings

-

VOC

-

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances

NAME:	orthophosphoric acid
IDENTIFICATION NOS.:	CAS-no: 7664-38-2 EC-no: 231-633-2 Index-no: 015-011-00-6
CONTENT:	25%
DSD CLASSIFICATION:	C; R34
CLP CLASSIFICATION:	Skin Corr. 1B H314

NAME:	(2-methoxymethylethoxy)propanol
IDENTIFICATION NOS.:	CAS-no: 34590-94-8 EC-no: 252-104-2
CONTENT:	1-5%
DSD CLASSIFICATION:	-
CLP CLASSIFICATION:	-
NOTE:	S

NAME:	C9-11 PARETH-3
IDENTIFICATION NOS.:	CAS-no: 68439-46-3
CONTENT:	1-5%
DSD CLASSIFICATION:	i;R41 N;R50
CLP CLASSIFICATION:	Eye Dam. 1, Aquatic Acute 1 H318, H400

NAME:	propan-2-ol
IDENTIFICATION NOS.:	CAS-no: 67-63-0 EC-no: 200-661-7 Index-no: 603-117-00-0
CONTENT:	1-5%
DSD CLASSIFICATION:	F; R11 i; R36 R67
CLP CLASSIFICATION:	Flam. Liq. 2, Eye Irrit. 2, STOT SE 3 H225, H319, H336
NOTE:	S

NAME:	Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.
IDENTIFICATION NOS.:	CAS-no: 85536-14-7 EC-no: 287-494-3
CONTENT:	1-5%
DSD CLASSIFICATION:	C;R34 N;R51/53
CLP CLASSIFICATION:	Skin. Corr. 1B, Aquatic Chronic 2 H314, H411

( ) See full text of H/R-phrases in chapter 16. Occupational limits are listed in section 8, if these are available.
S = Organic solvent

Other informations

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. The doctor can contact the Work Environment Medical Clinic at Bispebjerg Hospital, tlf. 35 31 60 60 Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the person into fresh air and stay with them.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses. Flush eyes with plenty of water (20-30°C) for at least 15 minutes and continue until irritation stops. Make sure you flush under the upper and lower eyelids. Contact a doctor at once.

Ingestion

Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.

Burns

Rinse with water until the pain stops and continue for 30 minutes.

4.2. Most important symptoms and effects, both acute and delayed

Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.
Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

4.3. Indication of any immediate medical attention and special treatment needed

No special

Information to medics

Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture

If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Carbon oxides. Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses.

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid direct contact with spilled substances. Avoid inhalation of vapours from waste material.

6.2. Environmental precautions

No specific requirements.

6.3. Methods and material for containment and cleaning up

Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided. Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations.

6.4. Reference to other sections

See section on “Disposal” with regard to the handling of waste. See section on 'Exposure controls/personal protection for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

See section on Exposure controls/personal protection for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original.

Storage temperature

Cool and dry

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL

propan-2-ol (EH40/2005)
Long-term exposure limit (8-hour TWA reference period): 400 ppm 999 mg/m3
Short-term exposure limit (15-minute reference period): 500 ppm 1250 mg/m3

(2-methoxymethylethoxy)propanol (EH40/2005)
Long-term exposure limit (8-hour TWA reference period): 50 ppm 308 mg/m3
Short-term exposure limit (15-minute reference period): - ppm - mg/m3
Comments: Sk (Sk = Can be absorbed through skin.)

orthophosphoric acid (EH40/2005)
Long-term exposure limit (8-hour TWA reference period): - ppm 1 mg/m3
Short-term exposure limit (15-minute reference period): - ppm 2 mg/m3

DNEL / PNEC

DNEL (propan-2-ol): 89 mg/m3 - Exposure: Inhalation - Duration: Long term - Remarks: General population
DNEL (propan-2-ol): 26 mg/kg - Exposure: Oral - Duration: Long term - Remarks: General population
DNEL (propan-2-ol): 888 mg/kg - Exposure: Dermal - Duration: Long term - Remarks: Workers
DNEL (propan-2-ol): 500 mg/m3 - Exposure: Inhalation - Duration: Long term - Remarks: Workers
DNEL (propan-2-ol): 319 mg/kg - Exposure: Dermal - Duration: Long term - Remarks: General population
DNEL (orthophosphoric acid): 2,92 mg/m3 - Exposure: Inhalation - Duration: long term - local effects - Remarks: Workers
DNEL (orthophosphoric acid): 0,73 mg/m3 - Exposure: Inhalation - Duration: long term - local effects - Remarks: General population
DNEL (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 170 mg/kg - Exposure: Dermal - Duration: Long term - systemic effects - Remarks: Workers
DNEL (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 12 mg/m3 - Exposure: Inhalation - Duration: Long term - systemic effects - Remarks: Workers
DNEL (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 12 mg/m3 - Exposure: Inhalation - Duration: long term - local effects - Remarks: Workers

DNEL (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 85 mg/kg - Exposure: Dermal - Duration: Long term - systemic effects - Remarks: General population
DNEL (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 3 mg/m3 - Exposure: Inhalation - Duration: Long term - systemic effects - Remarks: General population
DNEL (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 0,85 mg/kg - Exposure: Oral - Duration: Long term - systemic effects - Remarks: General population
DNEL (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 3 mg/m3 - Exposure: Inhalation - Duration: long term - local effects - Remarks: General population

PNEC (propan-2-ol): 140,9 mg/L - Exposure: Water - Duration: Single - Remarks: Fresh water
PNEC (propan-2-ol): 140,9 mg/L - Exposure: Water - Duration: Single - Remarks: Marine water
PNEC (propan-2-ol): 28 mg/kg - Exposure: Soil - Duration: Single
PNEC (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 0,287 mg/L - Exposure: Water - Remarks: Fresh water
PNEC (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 0,0287 mg/L - Exposure: Water - Remarks: Marine water
PNEC (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 0,0167 mg/L - Exposure: Water - Remarks: Intermittent releases
PNEC (Benzenesulfonic acid, 4-C10-13-sec-alkyl derivs.): 35 mg/kg - Exposure: Soil

8.2. Exposure controls

Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations

Smoking, consumption of food or liquid, and storage of tobacco, food or liquid, are not allowed in the workroom.

Exposure scenarios

There is no exposure scenario for this product.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values above.

Appropriate technical measures

Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see above). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.

Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment

Generally

Only CE-marked personal protection equipment should be used.

Respiratory Equipment

No specific requirements.

Skin protection

Special work clothing should be used.

Hand protection

Recommended: Nitrile rubber.

Eye protection

Use face shield. Use safety glasses with a side shield as an alternative.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Liquid	-	-	-	-	-

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
Not flammable	-	-

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Soluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity
No data available

10.2. Chemical stability
The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions
No special

10.4. Conditions to avoid
Do not expose to heat (e.g. sunlight), because it can lead to excess pressure.

10.5. Incompatible materials
Strong acids, strong bases, strong oxidising agents, and strong catabolic agents.

10.6. Hazardous decomposition products
The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
propan-2-ol	Rat	LD50	Oral	5,84 g/kg
propan-2-ol	Rat	LC50	Inhalation	>10000 ppm/6 h
propan-2-ol	Rabbit	LD50	Dermal	16,4 mL/kg
orthophosphoric acid	Rat	LD50	Oral	1,7 mL/100 g BW
orthophosphoric acid	Rat	LC50	Inhalation	1217 mg/m3 (1h)
orthophosphoric acid	Rabbit	LD50	Dermal	2740 mg/kg
Benzenesulfonic acid, 4-C10-13...	Rat	LD50	Oral	1470 mg/kg
Benzenesulfonic acid, 4-C10-13...	Rat	LD50	Dermal	>2000 mg/kg

Long term effects
Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.
Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result
propan-2-ol	Algae	EC50	24 h	>1000000 ug/L
propan-2-ol	Daphnia	EC50	24 h	>10000 mg/L
propan-2-ol	Fish	LC50	96 h	10000 mg/L
orthophosphoric acid	Daphnia	EC50	48 h	>100 mg/L
orthophosphoric acid	Algae	EC50	72 h	>100 mg/L
Benzenesulfonic acid, 4-C10-13...	Fish	LC50	96 h	1,67 mg/L
Benzenesulfonic acid, 4-C10-13...	Daphnia	LC50	48 h	2,4 mg/L
Benzenesulfonic acid, 4-C10-13...	Algae	NOEC	72 h	2,4 mg/L

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result
propan-2-ol		No data available	No data available
orthophosphoric acid	Yes	No data available	No data available
Benzenesulfonic acid, 4-C10-13...		No data available	94%

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC
propan-2-ol	No	0,05	No data available
orthophosphoric acid	No	No data available	No data available

12.4. Mobility in soil

propan-2-ol: Log Koc= 0,117995, Calculated from LogPow (High mobility potential.).
Benzenesulfonic acid, 4-C10-13...: Log Koc= 2,61248, Calculated from LogPow (Moderate mobility potential.).

12.5. Results of PBT and vPvB assessment

No data available

12.6. Other adverse effects

This product contains ecotoxic substances which can have damaging effects on water-organisms. This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

The product is covered by the regulations on dangerous waste.

Waste

EWC code

20 01 29

Specific labelling

-

Contaminated packing

Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

Not listed as dangerous goods under ADR and IMDG regulations.

14.1 – 14.4

ADR/RID	UN number	UN proper shipping name	Transport hazard class(es)	Packing group	Notes

IMDG	UN-no.	Proper Shipping Name	Class	PG*	EmS	MP**	Hazardous constituent

14.5. Environmental hazards

-

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

( ) Packing group

( ) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

Designation according to EU Regulation No. 648/2004:
15-30%: Phosphates
5% : non-ionic surfactants

Demands for specific education

-

15.2. Chemical safety assessment

No

SECTION 16: Other information

Sources

EC regulation 1907/2006 (REACH)
Directive 2000/532/EC
EC Regulation 1272/2008 (CLP)

Full text of H/R-phrases as mentioned in section 3

R11 - Highly flammable.
R34 - Causes burns.
R36 - Irritating to eyes.
R41 - Risk of serious damage to eyes.
R50 - Very toxic to aquatic organisms.
R67 - Vapours may cause drowsiness and dizziness.
R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
H225 - Highly flammable liquid and vapour.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.
H319 - Causes serious eye irritation.
H336 - May cause drowsiness or dizziness.
H400 - Very toxic to aquatic life.
H411 - Toxic to aquatic life with long lasting effects.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

-

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet has been prepared and validated by

mediator.as, Centervej 2, DK-6000 Kolding. Konsulent: TS

Date of last essential change
(First cipher in SDS version)

-

Date of last minor change
(Last cipher in SDS version)

-

Sikkerhedsdatablad

1. Produktets handelsnavn og importør

Handelsnavn:	**KD-Check SD-1;Aerosol Art.-Nr. 9903.1. PR-nr. 1942519**
Producent:	KARL DEUTSCH Prüf- und Messgerätebau GmbH + Co KG Otto-Hausmann-Ring 101 D-42115 Wuppertal Deutschland Tlf.: (+49-202) 7192-0 Fax: (+49-202) 714932
Importør:	Altest NDT Udstyr ApS Metalgangen 19E 2690 Karlslunde Danmark Tlf: +45 46 15 34 44 Fax:+45 46 15 25 52

2. Sammensætning og oplysninger om indholdsstoffer

Indhold	CAS-nr	Indhold %	Faresymbol	R-sætninger
Isopropanol	67-63-0			
Bemærkninger:	Opslæmning af uorganiske stoffer i Isopropanol, propan, butan. Produktet er klassificeret som farligt stof ifølge Lov om Farlige stoffer / EU Regulativer.			

3. Fareidentifikation

ADVARSEL.
Trykbeholder. Må ikke udsættes for sollys eller temperaturer over 50^{0}C. Må ikke punkteres eller brændes. Gælder også for tomme beholdere. Spray ikke mod flammer eller hvidglødende materiale. Skal opbevares utilgængeligt for børn. BRANDFARLIGT: Brug – langt fra antændelige kilder – kun i områder med tilstrækkelig ventilation. Ellers kan det udløse dannelse af meget brandfarlige, eksplosive dampe. Sprayen må IKKE indåndes.

R12: Yders brandfarlig
R36: Irriterer øjnene
R67: Dampe kan forårsage træthed og døsighed.
S24/25: Undgå kontakt med huden og øjnene
S26: Kommer stoffet i øjnene, skylles straks grundigt med vand og læge kontaktes

4. Førstehjælpsforanstaltninger

General information	Ved truende bevidstløshed, skal transport foretages i aflåst sideleje. Fjern forurenet tøj øjeblikkeligt og kassér det på en sikker måde. Ved vedvarende symptomer søg læge.
Indånding:	Ved indånding, flyt den tilskadekomne ud i frisk luft, og hold den tilskadekomne i ro. I tilfælde af vejrtrækningsstop gives kunstigt åndedræt og kontakt øjeblikkelig læge.
Hudkontakt:	Vask øjeblikkelig med vand og sæbe. Søg læge hvis generne vedbliver.
Øjne:	Skyl med meget vand. Søg derefter læge.
Indtagelse:	Hvis den skadede kaster op, skal han vendes om på siden. Fremkald ikke opkastninger. Søg øjeblikkelig læge.

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5. Brandbekæmpelse	
Risiko ved brand:	Ved at udsætte produktet for brand kan udledning af sod, og andre organiske stoffer; CO forekomme.
Forholdsregler:	Ved risiko for brand afkøl containeren med vand.
Egnet slukningsmiddel:	Skum, pulver, kuldioxid (CO2), sand,. vandstråle, vandtåger.
IKKE egnet slukningsmiddel:	Vand i fuld tryk
Specielt til brandvæsnets info:	Brug iltapparat med uafhængig ilttilførsel.
6. Forholdsregler overfor udslip ved uheld	
Personlig beskyttelse:	Sørg for god ventilation, undgå kontakt med huden og øjne. Undgå at produktet lækker. Benyt beskyttelsesudstyr. Hold produktet borte fra åben ild. Ved udsættelse for dampe benyt åndedragsbeskyttelse.
Miljøbeskyttelse:	Må ikke bortkastes i almindelig affaldsbeholdere, må ikke komme i afløbet, og må ikke bortkastes i jorden.
Rengøringsmetoder:	Opsamles med absorberende materiale (sand, klæde, e.g. olie) Efter opsamling skal produktet bortkastes i henhold til loven.
7. Håndtering og opbevaring	
Håndtering:	Må kun bruges i områder med tilstrækkelig ventilation. Undgå dannelse af oliestøv.
Beskyttelse mod ild og eksplosion:	Holdes væk fra antændelige kilder. Rygning forbudt. Dampe kan eksplodere i blanding med luft. Produktets dampe er tungere end luften,. Tag sikkerhedsforanstaltninger mod statisk afladning.
Opbevaring:	Opbevar ikke produktet sammen med iltende materialer. Opbevar på et køligt og luftigt sted. Beskyt fra varme/overophedning. Opbevaring kun ifølge de lokale regulativer for aerosol produkter.
8. Eksponeringskontrol - personlige værnemidler	
Generelle beskyttende forholdsregler:	Inhalér ikke dampene. Undgå kontakt med øjne og hud.
Personlig beskyttelse:	Ved risiko for stænk skal beskyttelseshandsker (PVC) og –briller (tætsiddende) anvendes. Iltapparat skal være til stede i tilfælde af aerosol eller støvdannelse.
Personlig hygiejne:	Vask huden grundigt efter arbejde. Når der arbejdes må der ikke spises, drikkes, ryges eller tages medicin.
9. Fysiske og kemiske egenskaber	
Varebeskrivelse:	Opslæmmet, hvidt, kun let lugt.
pH:	Udfyldes ikke
Kogepunkt (gr. C.):	82ºC – 83ºC
Vægtfylde (g/cm^3):	0,79 (15ºC)
Flammepunkt (gr. C):	12ºC
Damptryk (kPa/gr. C):	4100 (20ºC)
Ekspl. Omr. (vol-%):	2-12
Opløselighed i vand (W-%):	Delvist uopløseligt i vand.
10. Stabilitet og reaktivitet	
Forhold, der bør undgås:	Udvikling af brandbare blandinger er muligt i luft, ved opvarmning over flammepunktet og / eller mens man sprayer eller forstøver.

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Materialer, der bør undgås: Farlige opløsningsstoffer:	Reaktioner med iltende materialer og stærke syrer. Mangelfuld forbrænding / termisk opløsning kan føre til dannelse af kuldioxid (CO_2) og farlige gaser så som kulilte.
11. Toksiologiske oplysninger	
	LD50 Akut oral, rotte: > 2.000 mg/kg
12. Miljøoplysninger.	
Bioakkumulering:	Må ikke bortkastes i miljøet. Ingen.
13. Bortskaffelse	
Affaldsnavn: Anbefalinger til aerosolindpakning:	Affaldskode (EAK): 16 05 01. Affaldsnavn: Industriel aerosol. Ifølge de lokale regulativer.
14. Transportoplysninger	
UN-Nr.: ADR/RID/GGVS/GGVE:	1950 Aerosol indpakning Klasse 2, Figur 5F
15. Oplysning om regulering.	
Klassifikationer: R-tekster: S-tekster: Vand fareklasse:	Produktet er mærket ifølge EU direktiver / Tysklands regulativer for farlige stoffer. Sundhedsskadelig Yderst brandfarlig R12: Yderst brandfarlig R36: Irriterer øjnene R67: Dampe kan forårsage træthed og døsighed S23: Undgå indånding af gas/røg/dampe/tåger S24/25: Undgå kontakt med huden og øjnene S26: Kommer stoffet I øjnene, skylles straks grundigt med vand og læge kontaktes. 1 (KBwS)

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16. Andre oplysninger

Alle givne data korresponderer til det nuværende kendskab og erfaring, som er baseret på gældende regulativer i Tyskland.

Dette datablad beskriver udelukkende sikkerhedsbeskrivelserne og giver derfor ingen garanti på nogen ejendele.

Dato: Karlslunde, 13. november 2007 Underskrift:

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VESTAS PROPRIETARY NOTICE

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
EL-K80 Contact Cleaner
Product no.
11505
REACH registration number
Not applicable
Other means of identification

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Contact Cleaner

Uses advised against
-
The full text of any mentioned and identified use categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
ITW Spraytec Nordic
Priorsvej 36
8600 Silkeborg
Tlf.: +45 86 82 64 44
SDS info.: www.itwinfo.dk
Contact person
Kundeservice: tlf 8682 6444
E-mail
info itw-spraytec.dk
SDS date
02-07-2015
SDS Version
1000.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

SECTION 2: Hazards identification

▼2.1. Classification of the substance or mixture

Aerosol 1; H229
Aerosol 1; H222
Eye Irrit. 2; H319
Aquatic Chronic 3; H412
EUH066

See full text of H-phrases in section 2.2.

2.2. Label elements

▼Hazard pictogram(s)

▼Signal word

Danger

Hazard statement(s)

Pressurised container: May burst if heated. (H229)
Extremely flammable aerosol. (H222)
Causes serious eye irritation. (H319)
Harmful to aquatic life with long lasting effects. (H412)

Safety statement(s)

General	-
Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210). Do not spray on an open flame or other ignition source. (P211). Do not pierce or burn, even after use. (P251).
	Use only outdoors or in a well-ventilated area. (P271). Wear eye protection. (P280).
Response	-
Storage	Protect from sunlight. Do no expose to temperatures exceeding 50 oC/122oF. (P410+P412).
Disposal	-

Identity of the substances primarily responsible for the major health hazards

-

2.3. Other hazards

This product contains an organic solvent. Repeated exposure to organic solvents can result in damage to the nervous system and inner organs, such as the liver and kidneys.

Additional labelling

Repeated exposure may cause skin dryness or cracking. (EUH066)

Additional warnings

-

VOC

VOC-MA : 760 g/l, MA IMUM VOC CONTENT (B/e): 840 g/l.

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances/Mixtures

NAME:	cyclopentane
IDENTIFICATION NOS.:	CAS-no: 287-92-3 EC-no: 206-016-6 Index-no: 601-030-00-2
CONTENT:	60-80%
CLP CLASSIFICATION:	Flam. Liq. 2, Aquatic Chronic 3 H225, H412
NOTE:	S
NAME:	propan-2-ol
IDENTIFICATION NOS.:	CAS-no: 67-63-0 EC-no: 200-661-7 Index-no: 603-117-00-0
CONTENT:	15-25%
CLP CLASSIFICATION:	Flam. Liq. 2, Eye Irrit. 2, STOT SE 3 H225, H319, H336
NOTE:	S
NAME:	carbon dioxide
IDENTIFICATION NOS.:	CAS-no: 124-38-9 EC-no: 204-696-9
CONTENT:	5-10%
CLP CLASSIFICATION:	Comp. Gas H280

( ) See full text of H-phrases in chapter 16. Occupational exposure limits are listed in section 8, if these are available.
S = Organic solvent

Other informations

Eye Cat. 2 Sum = Sum(Ci/S(G)CLi) = 1,336 - 0
N chronic (CAT 3) Sum = Sum(Ci/M(chronic)i 25 0.1 10 CATi) = 2,5024 - 3,7536

SECTION 4: First aid measures

4.1. Description of first aid measures

General information
In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation
Get the person into fresh air and stay with them.

Skin contact
Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact
Remove contact lenses. Flush eyes with water (20-30°C) for at least 15 minutes. Call a doctor.

Ingestion
Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.

Burns
Rinse with water until the pain stops and continue for 30 minutes.

4.2. Most important symptoms and effects, both acute and delayed
Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.
Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

4.3. Indication of any immediate medical attention and special treatment needed
No special

Information to medics
Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture
If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Carbon oxides. Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses.

Aerosols may explode if heated / fire.

5.3. Advice for firefighters
Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Stores that have not ignited must be cooled by water mist. Where possible, remove flammable materials. Make sure there is sufficient ventilation.

6.2. Environmental precautions
Avoid discharge to lakes, streams, sewers, etc. In the event of a leakage to the surroundings, contact the local environmental authorities. Consider putting up waste collecting trays/basins to prevent leakage to the surroundings.

6.3. Methods and material for containment and cleaning up
Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided.

6.4. Reference to other sections

See section on “Disposal considerations ” with regard to the handling of waste. See section on 'Exposure controls/personal protection for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Consider putting up waste collecting trays/basins to prevent leakage to the surroundings. See section on Exposure controls/personal protection for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original. Must be stored in a cool and ventilated area, away from possible sources of combustion.

Storage temperature

50°C

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL

carbon dioxide (EH40, 2011)
Long-term exposure limit (8-hour TWA reference period): 5000 ppm 9150 mg/m3
Short-term exposure limit (15-minute reference period): 15000 ppm 27400 mg/m3

propan-2-ol (EH40, 2005)
Long-term exposure limit (8-hour TWA reference period): 400 ppm 999 mg/m3
Short-term exposure limit (15-minute reference period): 500 ppm 1250 mg/m3

DNEL / PNEC

No data available.

8.2. Exposure controls

Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations

Observe general occupational hygiene.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.

Appropriate technical measures

Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see below). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.

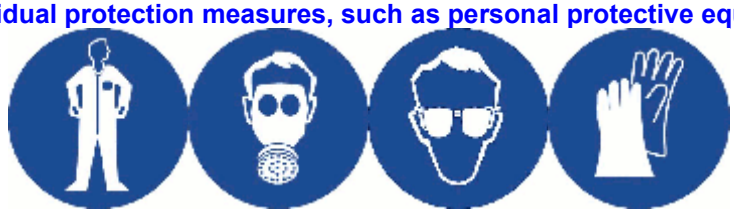
Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment



Generally

Use only CE marked protective equipment.

Respiratory Equipment

The product contains liquids with a low boiling point which are poorly absorbed on charcoal filters. The use of fresh air respiratory protective equipment is thus required. In most cases a mask with an A -filter is adequate, as the product normally is used only for a short period of time.

Skin protection
Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection
Recommended: Nitrile rubber. . See the manufacturer s instructions

Eye protection
Use face shield. Use safety glasses with a side shield as an alternative.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Aerosol	Colourless	Alcohol odor	7	-	0,8

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
-50	-	-

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Soluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity
No data available

10.2. Chemical stability
The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions
No special

10.4. Conditions to avoid
Avoid static electricity.

10.5. Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reductants agents.

10.6. Hazardous decomposition products
The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
propan-2-ol	Rat	LD50	Dermal	12800 mg/kg
propan-2-ol	Rabbit	LD50	Dermal	12870 mg/kg
propan-2-ol	Rat	LD50	Oral	4396 mg/kg
propan-2-ol	Rat	LC50	Inhalation	72,6 mg/L (4 h)

Skin corrosion/irritation
No data available.

Serious eye damage/irritation
Causes serious eye irritation.

Respiratory or skin sensitisation
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

Reproductive toxicity

No data available.

STOT-single exposure
No data available.

STOT-repeated exposure
No data available.

Aspiration hazard
No data available.

Long term effects
Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.
Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result
				9640 mg/l flow-through (Pimephales promelas)
propan-2-ol	Fish	LC50	96 h	11130 mg/L static
propan-2-ol	Fish	LC50	96 h	Pimephales promelas)
propan-2-ol	Algae	EC50	96 h	>1000 mg/L (Desmodesmus subspicatus)
propan-2-ol	Daphnia	EC50	48 h	= 13299 mg/L (Daphnia magna)
cyclopentane	Fish	LC50	96 h	100000 ug/L

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result

No data available.

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC

No data available.

12.4. Mobility in soil
No data available

12.5. Results of PBT and vPvB assessment
No data available

12.6. Other adverse effects
This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
The product is covered by the regulations on dangerous waste.

Waste
EWC code
16 05 04

Specific labelling
-

Contaminated packing
Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID

14.1. UN number	1950
14.2. UN proper shipping name	AEROSOLS, FLAMMABLE
14.3. Transport hazard class(es)	2.1
14.4. Packing group	II
Notes	-
Tunnel restriction code	D

IMDG

UN-no.	1950
Proper Shipping Name	AEROSOLS, FLAMMABLE
Class	2.1
PG*	II
EmS	F-D, S-U
MP**	-
Hazardous constituent	Cyclopentane, Isopropanol

IATA/ICAO

UN-no.	
Proper Shipping Name	
Class	
PG*	

14.5. Environmental hazards

-

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

( ) Packing group

( ) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC.

Demands for specific education

-

Additional information

Sources

EC regulation 1907/2006 (REACH)
Directive 2000/532/EC
EC Regulation 1272/2008 (CLP)

15.2. Chemical safety assessment

No

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3

H225 - Highly flammable liquid and vapour.
H280 - Contains gas under pressure; may explode if heated.
H319 - Causes serious eye irritation.
H336 - May cause drowsiness or dizziness.
H412 - Harmful to aquatic life with long lasting effects.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet is validated by

MJH

Date of last essential change
(First cipher in SDS version)

02-07-2015

Date of last minor change
(Last cipher in SDS version)

02-07-2015

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
ELS-33 El-isol Protection
Product no.
05395
REACH registration number
Not applicable

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Corrosion protection

Uses advised against
-
The full text of any mentioned and identified use categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
ITW Spraytec Nordic
Priorsvej 36
8600 Silkeborg
Tlf.: +45 86 82 64 44
SDS info.: www.itwinfo.dk
Contact person
Kundeservice: tlf 8682 6444
E-mail
info itw-spraytec.dk
SDS date
22-10-2015
SDS Version
2.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Aerosol 1; H229
Aerosol 1; H222
STOT SE 3; H336
Aquatic Chronic 2; H411
EUH066

See full text of H-phrases in section 2.2.

2.2. Label elements

Hazard pictogram(s)

Signal word
Danger
Hazard statement(s)

Pressurised container: May burst if heated. (H229)
Extremely flammable aerosol. (H222)
May cause drowsiness or dizziness. (H336)
Toxic to aquatic life with long lasting effects. (H411)

▼Safety statement(s)

General	-
Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210). Do not spray on an open flame or other ignition source. (P211). Do not pierce or burn, even after use. (P251). Use only outdoors or in a well-ventilated area. (P271). Wear protective clothing/protective gloves/eye protection/face protection. (P280).
Response	-
Storage	Protect from sunlight. Do no expose to temperatures exceeding 50 oC/122oF. (P410+P412).
Disposal	-

Identity of the substances primarily responsible for the major health hazards

Naphtha (petroleum), hydrodesulfurized heavy 0,1 w/w% benzene

2.3. Other hazards

Additional labelling

Repeated exposure may cause skin dryness or cracking. (EUH066)

Additional warnings

-

VOC

-

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances/Mixtures

NAME:	Naphtha (petroleum), hydrodesulfurized heavy 0,1 w/w% benzene
IDENTIFICATION NOS.:	CAS-no: 64742-82-1 EC-no: 265-185-4 Index-no: 649-330-00-2
CONTENT:	25-40%
CLP CLASSIFICATION:	Flam. Liq. 3, STOT SE 3, Asp. Tox. 1, Aquatic Chronic 2 H226, H304, H336, H411
NAME:	Petroleum gases, liquefied (0,1 % w/w 1,3-butadiene (EINECS No. 203-450-8))
IDENTIFICATION NOS.:	CAS-no: 68476-85-7 EC-no: 270-704-2 Index-no: 649-202-00-6
CONTENT:	15-25%
CLP CLASSIFICATION:	Comp. Gas, Flam. Gas 1 H220, H280
NAME:	Naphtha (petroleum), hydrotreated light (0,1 % w/w benzene (EINECS No 200-753-7)).
IDENTIFICATION NOS.:	CAS-no: 64742-49-0 EC-no: 265-151-9 Index-no: 649-328-00-1
CONTENT:	5-10%
CLP CLASSIFICATION:	Flam. Liq. 2, STOT SE 3, Skin Irrit. 2, Asp. Tox. 1, Aquatic Chronic 2 H225, H304, H315, H336, H411
NAME:	Sulfonic acids, petroleum, sodium salts
IDENTIFICATION NOS.:	CAS-no: 68608-26-4 EC-no: 271-781-5
CONTENT:	3-5%
CLP CLASSIFICATION:	Eye Irrit. 2 H319

( ) See full text of H-phrases in chapter 16. Occupational exposure limits are listed in section 8, if these are available.

Other informations

Eye Cat. 2 Sum = Sum(Ci/S(G)CLi) = 0,3696 - 0,5544
Skin Cat. 2 Sum = Sum(Ci/S(G)CLi) = 0,776 - 1
N chronic (CAT 2) Sum = Sum(Ci/M(chronic)i 25 0.1 10 CATi) = 1,155328 - 1,732992

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the person into fresh air and stay with them.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses. Flush eyes immediately with plenty of water (20-30°C) for at least 15 minutes and continue until irritation stops. Make sure you flush under the upper and lower eyelids. If irritation continues, contact a doctor.

Ingestion

Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.

Burns

Rinse with water until the pain stops and continue for 30 minutes.

4.2. Most important symptoms and effects, both acute and delayed

No special

4.3. Indication of any immediate medical attention and special treatment needed

No special

Information to medics

Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture

If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Carbon oxides. Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses. Aerosols may explode if heated / fire.

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid inhalation of vapours from waste material. Stores that have not ignited must be cooled by water mist. Where possible, remove flammable materials. Make sure there is sufficient ventilation.

6.2. Environmental precautions

Avoid discharge to lakes, streams, sewers, etc. In the event of a leakage to the surroundings, contact the local environmental authorities. Consider putting up waste collecting trays/basins to prevent leakage to the surroundings.

6.3. Methods and material for containment and cleaning up

Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided.

6.4. Reference to other sections

See section on "Disposal considerations " with regard to the handling of waste. See section on 'Exposure controls/personal protection for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Consider putting up waste collecting trays/basins to prevent leakage to the surroundings. See section on Exposure controls/personal protection for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original. Must be stored in a cool and ventilated area, away from possible sources of combustion.

Storage temperature

50°C

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL

Petroleum gases, liquefied (0,1 % w/w 1,3-butadiene (EINECS... (EH40, 2005)
Long-term exposure limit (8-hour TWA reference period): 1000 ppm 1750 mg/m3
Short-term exposure limit (15-minute reference period): 1250 ppm 2180 mg/m3
Comments: Carc (> 0,1%butadien) (Carc = Capable of causing cancer.)

DNEL / PNEC

DNEL (Naphtha (petroleum), hydrotreated light (0,1 % w/w benzene (EINECS No 200-753-7)).): 447 mg/m3
Exposure: Inhalation
Duration of Exposure: Long term – Systemic effects - General population

DNEL (Naphtha (petroleum), hydrotreated light (0,1 % w/w benzene (EINECS No 200-753-7)).): 2085 mg/m3
Exposure: Inhalation
Duration of Exposure: Long term – Systemic effects - Workers
DNEL (Naphtha (petroleum), hydrodesulfurized heavy 0,1 w/w% benzene): 26 mg/kg bw/day
Exposure: Oral
Duration of Exposure: Long term – Systemic effects - General population

DNEL (Naphtha (petroleum), hydrodesulfurized heavy 0,1 w/w% benzene): 26 mg/kg bw/day
Exposure: Dermal
Duration of Exposure: Long term – Systemic effects - General population

DNEL (Naphtha (petroleum), hydrodesulfurized heavy 0,1 w/w% benzene): 44 mg/kg bw/day
Exposure: Dermal
Duration of Exposure: Long term – Systemic effects - Workers

DNEL (Naphtha (petroleum), hydrodesulfurized heavy 0,1 w/w% benzene): 71 mg/m3
Exposure: Inhalation
Duration of Exposure: Long term – Systemic effects - General population

DNEL (Naphtha (petroleum), hydrodesulfurized heavy 0,1 w/w% benzene): 330 mg/m3
Exposure: Inhalation
Duration of Exposure: Long term – Systemic effects - Workers

8.2. Exposure controls

Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations

Observe general occupational hygiene.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.

Appropriate technical measures

Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see below). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.

Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment

Generally

Use only CE marked protective equipment.

Respiratory Equipment

The product contains liquids with a low boiling point which are poorly absorbed on charcoal filters. The use of fresh air respiratory protective equipment is thus required. In most cases a mask with an A -filter is adequate, as the product normally is used only for a short period of time.

Skin protection

Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection

Recommended: Nitrile rubber. See the manufacturer s instructions

Eye protection

Use face shield. Use safety glasses with a side shield as an alternative.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Aerosol	Brown	Characteristic	-	-	1

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
0	-	-

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Insoluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions

No special

10.4. Conditions to avoid

Avoid static electricity.

10.5. Incompatible materials

Strong acids, strong bases, strong oxidizing agents, and strong reductants agents.

10.6. Hazardous decomposition products

The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
Sulfonic acids, petroleum, sod...	Rat	LD50	Oral	> 6000 mg/kg
Naphtha (petroleum), hydrotrea...	Rabbit	LD50	Dermal	> 2000 mg/kg
Naphtha (petroleum), hydrotrea...	Rat	LD50	Oral	> 5000 mg/kg

Naphtha (petroleum), hydrodesu...	Rabbit	LD50	Dermal	> 3160 mg/kg
Naphtha (petroleum), hydrodesu...	Rat	LD50	Oral	> 5000 mg/kg

Skin corrosion/irritation
No data available.

Serious eye damage/irritation
No data available.

Respiratory or skin sensitisation
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

Reproductive toxicity
No data available.

STOT-single exposure
May cause drowsiness or dizziness.

STOT-repeated exposure
No data available.

Aspiration hazard
No data available.

Long term effects
No special

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result
Naphtha (petroleum), hydrodesu...	Daphnia	EC50	48 h	10-22 mg/l

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result

No data available.

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC

No data available.

12.4. Mobility in soil
No data available

12.5. Results of PBT and vPvB assessment
No data available

12.6. Other adverse effects
This product contains ecotoxic substances which can have damaging effects on water-organisms. This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
The product is covered by the regulations on dangerous waste.

Waste
EWC code
16 05 04

Specific labelling
-

Contaminated packing
Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID

14.1. UN number	1950
14.2. UN proper shipping name	AEROSOLS, FLAMMABLE

14.3. Transport hazard class(es)	2.1
14.4. Packing group	-
Notes	-
Tunnel restriction code	D

IMDG

UN-no.	1950
Proper Shipping Name	AEROSOLS, FLAMMABLE
Class	2.1
PG*	-
EmS	F-D, S-U
MP**	Yes
Hazardous constituent	Petroleumgases, liquified; Naphtha hydrotreated

IATA/ICAO

UN-no.	
Proper Shipping Name	
Class	
PG*	

14.5. Environmental hazards

This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

( ) Packing group

( ) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

-

Demands for specific education

-

Additional information

-

Sources

Council Directive 75/324/EEC of 20 May 1975 on the approximation of the laws of the Member States relating to aerosol dispensers.
EC Regulation 1272/2008 (CLP).
EC regulation 1907/2006 (REACH).

15.2. Chemical safety assessment

No

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3

H220 - Extremely flammable gas.
H225 - Highly flammable liquid and vapour.
H226 - Flammable liquid and vapour.
H280 - Contains gas under pressure; may explode if heated.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H336 - May cause drowsiness or dizziness.
H411 - Toxic to aquatic life with long lasting effects.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet is validated by

MJH

Date of last essential change
(First cipher in SDS version)

30-06-2015

Date of last minor change
(Last cipher in SDS version)

22-10-2015

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
FS-35A Spray
Product no.
06593
REACH registration number
Not applicable

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Freeze Spray

Uses advised against
-
The full text of any mentioned and identified use categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
ITW Spraytec Nordic
Priorsvej 36
8600 Silkeborg
Tlf.: +45 86 82 64 44
SDS info.: www.itwinfo.dk
Contact person
Kundeservice: tlf 8682 6444
E-mail
info itw-spraytec.dk
SDS date
22-10-2015
SDS Version
2.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Aerosol 3; H229
EUH210
This product is not classified as dangerous.
See full text of H-phrases in section 2.2.

2.2. Label elements

Hazard pictogram(s)
-
Signal word
Warning
Hazard statement(s)
Pressurised container: May burst if heated. (H229)

▼Safety statement(s)	General	-
	Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210). Do not pierce or burn, even after use. (P251).
	Response	-
	Storage	Protect from sunlight. Do no expose to temperatures exceeding 50

oC/122oF. (P410+P412).

Disposal -

Identity of the substances primarily responsible for the major health hazards

-

2.3. Other hazards

Contact with the skin may cause frostbite. Any frostbite should be treated as burns.

Additional labelling

6 % by mass of the contents are flammable.
Safety data sheet available on request. (EUH210)

Additional warnings

-

VOC

-

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances/Mixtures

NAME:	norflurane
IDENTIFICATION NOS.:	CAS-no: 811-97-2 EC-no: 212-377-0
CONTENT:	80-95%
CLP CLASSIFICATION:	Comp. Gas H280

NAME:	dimethyl ether
IDENTIFICATION NOS.:	CAS-no: 115-10-6 EC-no: 204-065-8 Index-no: 603-019-00-8
CONTENT:	5-10%
CLP CLASSIFICATION:	Press. Gas H220
NOTE:	S

( ) See full text of H-phrases in chapter 16. Occupational exposure limits are listed in section 8, if these are available.
S = Organic solvent

Other informations

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the person into fresh air and stay with them.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses. Flush eyes immediately with plenty of water (20-30°C) for at least 15 minutes and continue until irritation stops. Make sure you flush under the upper and lower eyelids. If irritation continues, contact a doctor.

Ingestion

Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.

Burns

Not applicable

4.2. Most important symptoms and effects, both acute and delayed

Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears,

tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.

4.3. Indication of any immediate medical attention and special treatment needed

No special

Information to medics

Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture

If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Halogenated compounds Carbon oxides. Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses. Aerosols may explode if heated / fire.

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

No specific requirements.

6.2. Environmental precautions

No specific requirements.

6.3. Methods and material for containment and cleaning up

Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided.

6.4. Reference to other sections

See section on “Disposal considerations ” with regard to the handling of waste. See section on 'Exposure controls/personal protection for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

See section on Exposure controls/personal protection for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original.

Storage temperature

50°C

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL

dimethyl ether (EH40, 2005)
Long-term exposure limit (8-hour TWA reference period): 400 ppm 766 mg/m3
Short-term exposure limit (15-minute reference period): 500 ppm 958 mg/m3

norflurane (EH40/2005, 2005)
Long-term exposure limit (8-hour TWA reference period): 1000 ppm 4240 mg/m3
Short-term exposure limit (15-minute reference period): - ppm - mg/m3

▼DNEL / PNEC

No data available.

8.2. Exposure controls

Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations

Smoking, consumption of food or liquid, and storage of tobacco, food or liquid, are not allowed in the workroom.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.

Appropriate technical measures

Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see below). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.

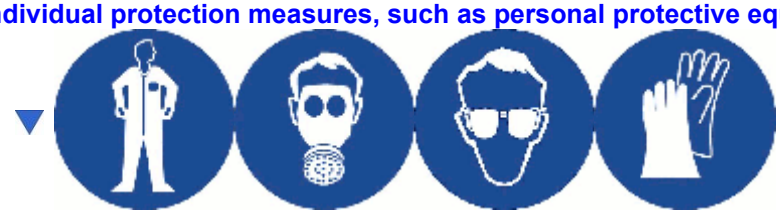
Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment



Generally

Use only CE marked protective equipment.

Respiratory Equipment

Respiratory protection is not normally required in well-ventilated areas. In case of inadequate ventilation a respirator with filter A2 is recommended.

Skin protection

Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection

Recommended: Lether glowes. See the manufacturer s instructions

Eye protection

Use safety glasses with a side shield.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Aerosol	Colourless	Characteristic	-	-	-

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
-	-	-

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Insoluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability
The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions
No special

10.4. Conditions to avoid
No special

10.5. Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reductants agents.

10.6. Hazardous decomposition products
The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
dimethyl ether	Rat	LC50	Inhalation	164000
norflurane	Mouse	LC50	Inhalation	1700 g/m3

Skin corrosion/irritation
No data available.

Serious eye damage/irritation
No data available.

Respiratory or skin sensitisation
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

Reproductive toxicity
No data available.

STOT-single exposure
No data available.

STOT-repeated exposure
No data available.

Aspiration hazard
No data available.

Long term effects
Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result
No data available.				

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result
No data available.			

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC
No data available.			

12.4. Mobility in soil
norflurane: Log Koc= 1,408792, Calculated from LogPow (High mobility potential.).

12.5. Results of PBT and vPvB assessment
No data available

12.6. Other adverse effects
No special

SECTION 13: Disposal considerations

13.1. Waste treatment methods

This product is not covered by the regulations on dangerous waste.

Waste

EWC code

16 05 04

Specific labelling

-

Contaminated packing

No specific requirements.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID

14.1. UN number	1950
14.2. UN proper shipping name	AEROSOLS, SUFFOCATING
14.3. Transport hazard class(es)	2.2
14.4. Packing group	-
Notes	-
Tunnel restriction code	E

IMDG

UN-no.	1950
Proper Shipping Name	AEROSOLS, SUFFOCATING
Class	2.2
PG*	-
EmS	F-D, S-U
MP**	No
Hazardous constituent	Norflurane, Dimethylether

IATA/ICAO

UN-no.	
Proper Shipping Name	
Class	
PG*	

14.5. Environmental hazards

-

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

( ) Packing group

( ) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC.

Demands for specific education

-

Additional information

Sources

Council Directive 94/33/EC of 22 June 1994 on the protection of young people at work.
Council Directive 75/324/EEC of 20 May 1975 on the approximation of the laws of the Member States relating to aerosol dispensers.
EC Regulation 1272/2008 (CLP).
EC regulation 1907/2006 (REACH).

15.2. Chemical safety assessment

No

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3

H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet is validated by

MJH

Date of last essential change
(First cipher in SDS version)

19-06-2015

Date of last minor change
(Last cipher in SDS version)

22-10-2015

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
FW-1661 Spray
Product no.
12875
REACH registration number
Not applicable

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Leak Detector

Uses advised against
-
The full text of any mentioned and identified use categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
ITW Spraytec Nordic
Priorsvej 36
8600 Silkeborg
Tlf.: +45 86 82 64 44
SDS info.: www.itwinfo.dk
Contact person
Kundeservice: tlf 8682 6444
E-mail
info itw-spraytec.dk
SDS date
18-01-2016
SDS Version
2.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Aerosol 3; H229

See full text of H-phrases in section 2.2.

2.2. Label elements

Hazard pictogram(s)
-
Signal word
Warning
Hazard statement(s)
Pressurised container: May burst if heated. (H229)

Safety statement(s)	General	Keep out of reach of children. (P102).
	Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210). Do not pierce or burn, even after use. (P251). Avoid breathing spray/mist. (P261). Use only outdoors or in a well-ventilated area. (P271).
	Response	-

Storage	Protect from sunlight. Do no expose to temperatures exceeding 50 oC/122oF. (P410+P412).
Disposal	-

Identity of the substances primarily responsible for the major health hazards

-

2.3. Other hazards

Additional labelling

-

Additional warnings

-

VOC

-

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances/Mixtures

NAME:	Propan-1,2-diol
IDENTIFICATION NOS.:	CAS-no: 57-55-6 EC-no: 200-338-0
CONTENT:	25-40%
CLP CLASSIFICATION:	NA
NAME:	N,N-bis(2-hydroxyethyl)oleamide
IDENTIFICATION NOS.:	CAS-no: 93-83-4 EC-no: 202-281-7
CONTENT:	3%
CLP CLASSIFICATION:	Skin Irrit. 2, Eye Dam. 1 H315, H318
NAME:	carbon dioxide
IDENTIFICATION NOS.:	CAS-no: 124-38-9 EC-no: 204-696-9
CONTENT:	1-3%
CLP CLASSIFICATION:	Comp. Gas H280

( ) See full text of H-phrases in chapter 16. Occupational exposure limits are listed in section 8, if these are available.

Other informations

ATEmix(oral) > 2000
Eye Cat. 2 Sum = Sum(Ci/S(G)CLi) = 0,2 - 0,3
Skin Cat. 2 Sum = Sum(Ci/S(G)CLi) = 0,2 - 0,3

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the person into fresh air and stay with them.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses. Flush eyes immediately with plenty of water (20-30°C) for at least 15 minutes and continue until irritation stops. Make sure you flush under the upper and lower eyelids. If irritation continues, contact a doctor.

Ingestion

Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.

Burns

Not applicable

4.2. Most important symptoms and effects, both acute and delayed
No special

4.3. Indication of any immediate medical attention and special treatment needed
No special

Information to medics
Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture
If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Nitrogen oxides. Carbon oxides. Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses. Aerosols may explode if heated / fire.

5.3. Advice for firefighters
Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
No specific requirements.

6.2. Environmental precautions
No specific requirements.

6.3. Methods and material for containment and cleaning up
Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided.

6.4. Reference to other sections
See section on “Disposal considerations ” with regard to the handling of waste. See section on Exposure controls/personal protection for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
See section on Exposure controls/personal protection for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities
Always store in containers of the same material as the original.

Storage temperature
50°C

7.3. Specific end use(s)
This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL

carbon dioxide (EH40, 2011)
Long-term exposure limit (8-hour TWA reference period): 5000 ppm 9150 mg/m3
Short-term exposure limit (15-minute reference period): 15000 ppm 27400 mg/m3

DNEL / PNEC
No data available.

8.2. Exposure controls
Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations
Observe general occupational hygiene.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.

Appropriate technical measures

Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see below). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.

Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment

Generally

Use only CE marked protective equipment.

Respiratory Equipment

Respiratory protection is not normally required in well-ventilated areas. In case of inadequate ventilation a respirator with filter A2 is recommended.

Skin protection

Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection

No specific requirements.

Eye protection

Use face shield. Use safety glasses with a side shield as an alternative.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Aerosol	White	None	-	-	0,76

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
-	-	-

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Soluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions

No special

10.4. Conditions to avoid

No special

10.5. Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reductants agents.

10.6. Hazardous decomposition products
The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
N,N-bis(2-hydroxyethyl)oleamid...	Mouse	LD50	Oral	10000 mg/kg
Propan-1,2-diol	Mouse	LD50	Oral	22000 mg/kg
Propan-1,2-diol	Rabbit	LD50		20800 mg/kg
Propan-1,2-diol	Rat	LD50		6423 mg/kg

Skin corrosion/irritation
No data available.

Serious eye damage/irritation
No data available.

Respiratory or skin sensitisation
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

Reproductive toxicity
No data available.

STOT-single exposure
No data available.

STOT-repeated exposure
No data available.

Aspiration hazard
No data available.

Long term effects
No special

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result
Propan-1,2-diol	Daphnia	LC50	48 h	1000 mg/L
Propan-1,2-diol	Fish	LC50	96 h	710 mg/L

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result
No data available.			

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC
No data available.			

12.4. Mobility in soil
Propan-1,2-diol: Log Koc= -0,650148, Calculated from LogPow ().

12.5. Results of PBT and vPvB assessment
No data available

12.6. Other adverse effects
No special

SECTION 13: Disposal considerations

13.1. Waste treatment methods
This product is not covered by the regulations on dangerous waste.

Waste
EWC code
16 05 04

Specific labelling

-

Contaminated packing

Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID

14.1. UN number	1950
14.2. UN proper shipping name	AEROSOLS, SUFFOCATING
14.3. Transport hazard class(es)	2.2
14.4. Packing group	-
Notes	-
Tunnel restriction code	E

IMDG

UN-no.	1950
Proper Shipping Name	AEROSOLS, SUFFOCATING
Class	2.2
PG*	-
EmS	F-D, S-U
MP**	No
Hazardous constituent	-

IATA/ICAO

UN-no.	
Proper Shipping Name	
Class	
PG*	

14.5. Environmental hazards

-

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

( ) Packing group

( ) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

-

Demands for specific education

-

Additional information

Sources

Council Directive 75/324/EEC of 20 May 1975 on the approximation of the laws of the Member States relating to aerosol dispensers.
EC Regulation 1272/2008 (CLP).
EC regulation 1907/2006 (REACH).

15.2. Chemical safety assessment

No

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3

H280 - Contains gas under pressure; may explode if heated.
H315 - Causes skin irritation.
H318 - Causes serious eye damage.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet is validated by

MJHMJH

Date of last essential change
(First cipher in SDS version)

26-05-2015

Date of last minor change
(Last cipher in SDS version)

18-01-2016

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
GM-12 Sliding Agent
Product no.
07395
REACH registration number
Not applicable
Other means of identification

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Sliding Agent

Uses advised against
-
The full text of any mentioned and identified use categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
ITW Spraytec Nordic
Priorsvej 36
8600 Silkeborg
Tlf.: +45 86 82 64 44
SDS info.: www.itwinfo.dk
Contact person
Kundeservice: tlf 8682 6444
E-mail
info itw-spraytec.dk
SDS date
17-06-2015
SDS Version
1.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Aerosol 1; H229
Aerosol 1; H222

See full text of H-phrases in section 2.2.

2.2. Label elements

Hazard pictogram(s)

Signal word
Danger
Hazard statement(s)
Pressurised container: May burst if heated. (H229)

Extremely flammable aerosol. (H222)

Safety statement(s)

General	-
Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210). Do not spray on an open flame or other ignition source. (P211). Do not pierce or burn, even after use. (P251). Use only outdoors or in a well-ventilated area. (P271).
Response	-
Storage	Protect from sunlight. Do no expose to temperatures exceeding 50 oC/122oF. (P410+P412).
Disposal	-

Identity of the substances primarily responsible for the major health hazards

-

2.3. Other hazards

This product contains an organic solvent. Repeated exposure to organic solvents can result in damage to the nervous system and inner organs, such as the liver and kidneys.

Additional labelling

-

Additional warnings

-

VOC

VOC-MA : 475 g/l, MA IMUM VOC CONTENT (B/e): 840 g/l.

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances/Mixtures

NAME:	Petroleum gases, liquefied (0,1 % w/w 1,3-butadiene (EINECS No. 203-450-8))
IDENTIFICATION NOS.:	CAS-no: 68476-85-7 EC-no: 270-704-2 Index-no: 649-202-00-6
CONTENT:	60-80%
CLP CLASSIFICATION:	Comp. Gas, Flam. Gas 1 H220, H280

NAME:	cyclopentane
IDENTIFICATION NOS.:	CAS-no: 287-92-3 EC-no: 206-016-6 Index-no: 601-030-00-2
CONTENT:	15-25%
CLP CLASSIFICATION:	Flam. Liq. 2, STOT SE 3, Asp. Tox. 1, Aquatic Chronic 3 H225, H304, H336, H412
NOTE:	S

( ) See full text of H-phrases in chapter 16. Occupational exposure limits are listed in section 8, if these are available.
S = Organic solvent

Other informations

N chronic (CAT 4) Sum = Sum(Ci/M(chronic)i 25 0.1 10 CAT4) = 0,57056 - 0,85584

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the person into fresh air and stay with them.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses. Flush eyes immediately with plenty of water (20-30°C) for at least 15 minutes and continue until irritation stops. Make sure you flush under the upper and lower eyelids. If irritation continues, contact a doctor.

Ingestion

Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.

Burns

Rinse with water until the pain stops and continue for 30 minutes.

4.2. Most important symptoms and effects, both acute and delayed

Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.

4.3. Indication of any immediate medical attention and special treatment needed

No special

Information to medics

Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture

If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Carbon oxides. Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses.

Aerosols may explode if heated / fire.

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Stores that have not ignited must be cooled by water mist. Where possible, remove flammable materials. Make sure there is sufficient ventilation.

6.2. Environmental precautions

No specific requirements.

6.3. Methods and material for containment and cleaning up

Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided.

6.4. Reference to other sections

See section on “Disposal considerations ” with regard to the handling of waste. See section on 'Exposure controls/personal protection for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

See section on Exposure controls/personal protection for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original. Must be stored in a cool and ventilated area, away from possible sources of combustion.

Storage temperature

50°C

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL

Petroleum gases, liquefied (0,1 % w/w 1,3-butadiene (EINECS...
Long-term exposure limit (8-hour TWA reference period): 1000 ppm 1750 mg/m3
Short-term exposure limit (15-minute reference period): 1250 ppm 2180 mg/m3

DNEL / PNEC

No data available.

8.2. Exposure controls

Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations

▼ Observe general occupational hygiene.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.

Appropriate technical measures

Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see below). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.

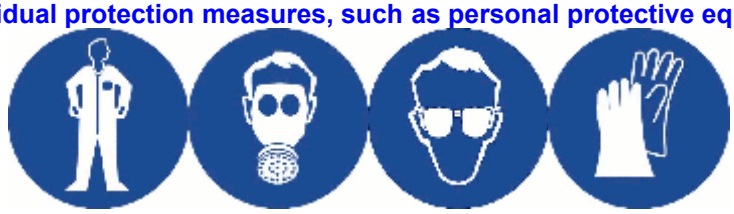
Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment



Generally

Use only CE marked protective equipment.

Respiratory Equipment

The product contains liquids with a low boiling point which are poorly absorbed on charcoal filters. The use of fresh air respiratory protective equipment is thus required. In most cases a mask with an A -filter is adequate, as the product normally is used only for a short period of time.

Skin protection

Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection

Recommended: Nitrile rubber. . See the manufacturer s instructions

Eye protection

Use face shield. Use safety glasses with a side shield as an alternative.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Aerosol	Colourless	Sweet	ca. 7	-	0,6

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
-100	-	-

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Insoluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity
No data available

10.2. Chemical stability
The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions
No special

10.4. Conditions to avoid
Avoid static electricity.

10.5. Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reductants agents.

10.6. Hazardous decomposition products
The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
No data available.				

Skin corrosion/irritation
No data available.

Serious eye damage/irritation
No data available.

Respiratory or skin sensitisation
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

Reproductive toxicity
No data available.

STOT-single exposure
No data available.

STOT-repeated exposure
No data available.

Aspiration hazard
No data available.

Long term effects
Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result
cyclopentane	Fish	LC50	96 h	100000 ug/L

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result
No data available.			

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC

No data available.

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

No data available

12.6. Other adverse effects

This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

The product is covered by the regulations on dangerous waste.

Waste

EWC code

16 05 04

Specific labelling

-

Contaminated packing

Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID

14.1. UN number	1950
14.2. UN proper shipping name	AEROSOLS, FLAMMABLE
14.3. Transport hazard class(es)	2.1
14.4. Packing group	II
Notes	-
Tunnel restriction code	D

IMDG

UN-no.	1950
Proper Shipping Name	AEROSOLS, FLAMMABLE
Class	2.1
PG*	II
EmS	F-D, S-U
MP**	-
Hazardous constituent	Petroleum gas; liquefied, Cyclopentane

IATA/ICAO

UN-no.	
Proper Shipping Name	
Class	
PG*	

14.5. Environmental hazards

-

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

( ) Packing group

( ) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC.

Demands for specific education

-

Additional information

Sources

EC regulation 1907/2006 (REACH)
Directive 2000/532/EC
EC Regulation 1272/2008 (CLP)

15.2. Chemical safety assessment

No

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3

H220 - Extremely flammable gas.
H225 - Highly flammable liquid and vapour.
H280 - Contains gas under pressure; may explode if heated.
H304 - May be fatal if swallowed and enters airways.
H336 - May cause drowsiness or dizziness.
H412 - Harmful to aquatic life with long lasting effects.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet is validated by

MJH

Date of last essential change
(First cipher in SDS version)

-

Date of last minor change
(Last cipher in SDS version)

-

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
RAL Colors
Product no.
07xxx
REACH registration number
Not applicable
Other means of identification

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Paint

Uses advised against
-
The full text of any mentioned and identified use categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
ITW Spraytec Nordic
Priorsvej 36
8600 Silkeborg
Tlf.: +45 86 82 64 44
SDS info.: www.itwinfo.dk
Contact person
Kundeservice: tlf 8682 6444
E-mail
info itw-spraytec.dk
SDS date
20-05-2015
SDS Version
1.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Eye Irrit. 2, STOT SE 3, Aerosol 1 // H229, EUH210, EUH066, H336, H319, H222
See full text of H/R-phrases in section 2.2.

DPD/DSD Classification
Extremely flammable (F+). Irritant (i).
Vapours may cause drowsiness and dizziness (R67). Repeated exposure may cause skin dryness or cracking (R66). Irritating to eyes (R36). Extremely flammable (R12).

2.2. Label elements

Hazard pictogram(s)

Signal word
Danger

Hazard statement(s)

Extremely flammable aerosol. (H222)
Causes serious eye irritation. (H319)
May cause drowsiness or dizziness. (H336)
Pressurised container: May burst if heated. (H229)

Safety statement(s)

General	Keep out of reach of children. (P102)
Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210) Do not spray on an open flame or other ignition source. (P211) Do not pierce or burn, even after use. (P251) Avoid breathing spray/mist. (P261) Use only outdoors or in a well-ventilated area. (P271)
Response	-
Storage	Protect from sunlight. Do no expose to temperatures exceeding 50 oC/122oF. (P410+P412)
Disposal	-

Identity of the substances primarily responsible for the major health hazards

acetone, 2-methoxy-1-methylethyl acetate

2.3. Other hazards

This product contains an organic solvent. Repeated exposure to organic solvents can result in damage to the nervous system and inner organs, such as the liver and kidneys.

Additional labelling

Repeated exposure may cause skin dryness or cracking. (EUH066) Safety data sheet available on request. (EUH210)

Additional warnings

-

VOC

VOC-MA : 716 g/l, MA IMUM VOC CONTENT (B/e): 840 g/l.

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances

NAME:	dimethyl ether
IDENTIFICATION NOS.:	CAS-no: 115-10-6 EC-no: 204-065-8 Index-no: 603-019-00-8
CONTENT:	60-80%
DSD CLASSIFICATION:	F+; R12
CLP CLASSIFICATION:	Press. Gas H220
NOTE:	S

NAME:	acetone
IDENTIFICATION NOS.:	CAS-no: 67-64-1 EC-no: 200-662-2 Index-no: 606-001-00-8
CONTENT:	40-60%
DSD CLASSIFICATION:	F; R11 i; R36 R66 R67
CLP CLASSIFICATION:	Flam. Liq. 2, Eye Irrit. 2, STOT SE 3 H225, H319, H336, EUH066
NOTE:	S

NAME:	2-methoxy-1-methylethyl acetate
IDENTIFICATION NOS.:	CAS-no: 108-65-6 EC-no: 203-603-9 Index-no: 607-195-00-7
CONTENT:	5-10%
DSD CLASSIFICATION:	R10
CLP CLASSIFICATION:	Flam. Liq. 3 H226
NOTE:	S

( ) See full text of H/R-phrases in chapter 16. Occupational exposure limits are listed in section 8, if these are available.
S = Organic solvent

Other informations

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet.

Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the person into fresh air and stay with them.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses. Flush eyes with water (20-30°C) for at least 15 minutes. Call a doctor.

Ingestion

Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.

Burns

Rinse with water until the pain stops and continue for 30 minutes.

4.2. Most important symptoms and effects, both acute and delayed

Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.
Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

4.3. Indication of any immediate medical attention and special treatment needed

No special

Information to medics

Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture

If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Carbon oxides. Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses. Aerosols may explode if heated / fire.

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid inhalation of vapours from waste material. Stores that have not ignited must be cooled by water mist. Where possible, remove flammable materials. Make sure there is sufficient ventilation.

6.2. Environmental precautions

No specific requirements.

6.3. Methods and material for containment and cleaning up

Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided.

6.4. Reference to other sections

See section on "Disposal considerations " with regard to the handling of waste. See section on Exposure controls/personal protection for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Smoking, consumption of food or liquid, and storage of tobacco, food or liquids are not allowed in the workrooms. See section on Exposure controls/personal protection for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Must be stored in a cool and ventilated area, away from possible sources of combustion.

Storage temperature

50°C

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL

2-methoxy-1-methylethyl acetate (EH40/2005)
Long-term exposure limit (8-hour TWA reference period): 50 ppm 274 mg/m3
Short-term exposure limit (15-minute reference period): 100 ppm 548 mg/m3
Comments: Sk (Sk = Can be absorbed through skin.)

acetone (EH40/2005)
Long-term exposure limit (8-hour TWA reference period): 500 ppm 1210 mg/m3
Short-term exposure limit (15-minute reference period): 1500 ppm 3620 mg/m3

dimethyl ether (EH40/2005)
Long-term exposure limit (8-hour TWA reference period): 400 ppm 766 mg/m3
Short-term exposure limit (15-minute reference period): 500 ppm 958 mg/m3

DNEL / PNEC

No data available.

8.2. Exposure controls

Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations

Smoking, consumption of food or liquid, and storage of tobacco, food or liquid, are not allowed in the workroom.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.

Appropriate technical measures

Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see below). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.

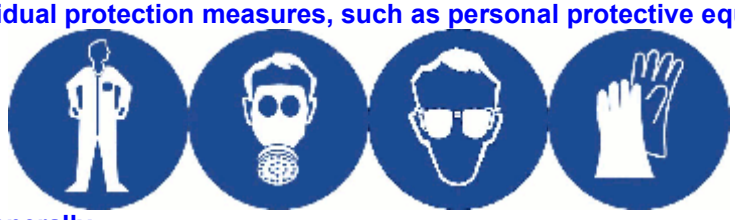
Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment



Generally

Only CE-marked personal protection equipment should be used. Use only CE marked protective equipment.

Respiratory Equipment

The product contains liquids with a low boiling point which are poorly absorbed on charcoal filters. The use of fresh air respiratory protective equipment is thus required. In most cases a mask with an A -filter is adequate, as the product normally is used only for a short period of time.

Skin protection

Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection

Recommended: 4H/Barrier. . See the manufacturer s instructions

Eye protection

Use face shield. Use safety glasses with a side shield as an alternative.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Aerosol	Various colours	Characteristic	-	-	0,8

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
0	-	-

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Insoluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available

10.2. Chemical stability

The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions

No special

10.4. Conditions to avoid

Avoid static electricity.

10.5. Incompatible materials

Strong acids, strong bases, strong oxidizing agents, and strong reductants agents.

10.6. Hazardous decomposition products

The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
dimethyl ether	Rat	LC50	Inhalation	164000

Skin corrosion/irritation

No data available.

Serious eye damage/irritation

Causes serious eye irritation.

Respiratory or skin sensitisation

No data available.

Germ cell mutagenicity

No data available.

Carcinogenicity

No data available.

Reproductive toxicity

No data available.

STOT-single exposure

May cause drowsiness or dizziness.

STOT-repeated exposure

No data available.

Aspiration hazard

No data available.

Long term effects

Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.
Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result

No data available.

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result

No data available.

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC

No data available.

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

No data available

12.6. Other adverse effects

No special

SECTION 13: Disposal considerations

13.1. Waste treatment methods

This product is not covered by the regulations on dangerous waste.

Waste

EWC code
16 05 04

Specific labelling

-

Contaminated packing

Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID

14.1. UN number	1950
14.2. UN proper shipping name	AEROSOLS, FLAMMABLE
14.3. Transport hazard class(es)	2.1
14.4. Packing group	II
Notes	-
Tunnel restriction code	D

IMDG

UN-no.	1950
Proper Shipping Name	AEROSOLS, FLAMMABLE
Class	2.1

PG*	II
EmS	F-D, S-U
MP**	No
Hazardous constituent	Acetone, Dimethylether

IATA/ICAO

UN-no.

Proper Shipping Name

Class

PG*

14.5. Environmental hazards

-

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

( ) Packing group

( ) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC.

Demands for specific education

-

Additional information

-

Sources

EC regulation 1907/2006 (REACH)
Directive 2000/532/EC
EC Regulation 1272/2008 (CLP)

15.2. Chemical safety assessment

No

SECTION 16: Other information

Full text of H/R-phrases as mentioned in section 3

R10 - Flammable.
R11 - Highly flammable.
R12 - Extremely flammable.
R36 - Irritating to eyes.
R66 - Repeated exposure may cause skin dryness or cracking.
R67 - Vapours may cause drowsiness and dizziness.
H220 - Extremely flammable gas.
H225 - Highly flammable liquid and vapour.
H226 - Flammable liquid and vapour.
H319 - Causes serious eye irritation.
H336 - May cause drowsiness or dizziness.
EUH066 - Repeated exposure may cause skin dryness or cracking.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.

The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet is validated by

MJH

Date of last essential change
(First cipher in SDS version)

-

Date of last minor change
(Last cipher in SDS version)

-

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
Zn-595 Zinc Spray
Product no.
25285
REACH registration number
Not applicable

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Zincspray

Uses advised against
-
The full text of any mentioned and identified use categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
ITW Spraytec Nordic
Priorsvej 36
8600 Silkeborg
Tlf.: +45 86 82 64 44
SDS info.: www.itwinfo.dk
Contact person
Kundeservice: tlf 8682 6444
E-mail
info itw-spraytec.dk
SDS date
22-10-2015
SDS Version
2.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Aerosol 1; H229
Aerosol 1; H222
Skin Irrit. 2; H315
Aquatic Acute 1; H400
Aquatic Chronic 1; H410

See full text of H-phrases in section 2.2.

2.2. Label elements

Hazard pictogram(s)

Signal word
Danger
Hazard statement(s)

Pressurised container: May burst if heated. (H229)
Extremely flammable aerosol. (H222)
Causes skin irritation. (H315)
Very toxic to aquatic life with long lasting effects. (H410)

Safety statement(s)

General	-
Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210). Do not spray on an open flame or other ignition source. (P211). Do not pierce or burn, even after use. (P251). Use only outdoors or in a well-ventilated area. (P271). Avoid release to the environment. (P273).
Response	-
Storage	Protect from sunlight. Do no expose to temperatures exceeding 50 oC/122oF. (P410+P412).
Disposal	-

Identity of the substances primarily responsible for the major health hazards

-

2.3. Other hazards

This product contains an organic solvent. Repeated exposure to organic solvents can result in damage to the nervous system and inner organs, such as the liver and kidneys.

Additional labelling

-

Additional warnings

-

VOC

VOC-MA : 621 g/l, MA IMUM VOC CONTENT (B/e): 840 g/l.

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances/Mixtures

NAME:	zinc
IDENTIFICATION NOS.:	CAS-no: 7440-66-6 EC-no: 231-175-3 Index-no: 030-001-00-1
CONTENT:	40-60%
CLP CLASSIFICATION:	Aquatic Acute 1, Aquatic Chronic 1 H400, H410

NAME:	Aromatic hydrocarbons, C8 Light Oil Redistillate, high boiling
IDENTIFICATION NOS.:	CAS-no: 90989-38-1 EC-no: 292-694-9 Index-no: 648-010-00-
CONTENT:	15-25%
CLP CLASSIFICATION:	Flam. Liq. 3, Acute Tox. 4, Skin Irrit. 2, Asp. Tox. 1 H226, H304, H312, H315, H332

NAME:	Butane (0,1 % butadiene (203-450-8)
IDENTIFICATION NOS.:	CAS-no: 106-97-8 EC-no: 203-448-7 Index-no: 601-004-00-0
CONTENT:	10-15%
CLP CLASSIFICATION:	Flam. Gas 1 H220
NOTE:	S

NAME:	acetone
IDENTIFICATION NOS.:	CAS-no: 67-64-1 EC-no: 200-662-2 Index-no: 606-001-00-8
CONTENT:	5-10%
CLP CLASSIFICATION:	Flam. Liq. 2, Eye Irrit. 2, STOT SE 3 H225, H319, H336, EUH066
NOTE:	S

NAME:	zinc oxide
IDENTIFICATION NOS.:	CAS-no: 1314-13-2 EC-no: 215-222-5 Index-no: 030-013-00-7
CONTENT:	5-10%
CLP CLASSIFICATION:	Aquatic Acute 1, Aquatic Chronic 1 H400, H410

NAME:	xylene
IDENTIFICATION NOS.:	CAS-no: 1330-20-7 EC-no: 215-535-7 Index-no: 601-022-00-9
CONTENT:	5-10%
CLP CLASSIFICATION:	Flam. Liq. 3, Acute tox. 4, Skin Irrit. 2 H226, H312, H315, H332
NOTE:	S

NAME:	propane
IDENTIFICATION NOS.:	CAS-no: 74-98-6 EC-no: 200-827-9 Index-no: 601-003-00-5
CONTENT:	5-10%
CLP CLASSIFICATION:	Press. Gas H220
NAME:	dimethyl ether
IDENTIFICATION NOS.:	CAS-no: 115-10-6 EC-no: 204-065-8 Index-no: 603-019-00-8
CONTENT:	5-10%
CLP CLASSIFICATION:	Press. Gas H220
NOTE:	S
NAME:	1-nitropropane
IDENTIFICATION NOS.:	CAS-no: 108-03-2 EC-no: 203-544-9 Index-no: 609-001-00-6
CONTENT:	3-5%
CLP CLASSIFICATION:	Flam. Liq. 3, Acute tox. 4 H226, H302, H312, H332
NOTE:	S

( ) See full text of H-phrases in chapter 16. Occupational exposure limits are listed in section 8, if these are available.
S = Organic solvent

Other informations

ATEmix(inhale, vapour) > 20
ATEmix(dermal) > 2000
ATEmix(oral) > 2000
Eye Cat. 2 Sum = Sum(Ci/S(G)CLi) = 0,56 - 0,84
Skin Cat. 2 Sum = Sum(Ci/S(G)CLi) = 2,552 - 3,828
N chronic (CAT 1) Sum = Sum(Ci/M(chronic)i 25) = 1,5168 - 2,2752
N acute (CAT 1) Sum = Sum(Ci/M(acute)i 25) = 1,5168 - 2,2752

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the person into fresh air and stay with them.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses. Flush eyes immediately with plenty of water (20-30°C) for at least 15 minutes and continue until irritation stops. Make sure you flush under the upper and lower eyelids. If irritation continues, contact a doctor.

Ingestion

Give the person plenty to drink and stay with the person. If the person feels unwell, contact a doctor immediately and take this safety data sheet or the label from the product with you. Do not induce vomiting unless recommended by the doctor. Hold head facing down so that no vomit runs back into the mouth and throat.

Burns

Rinse with water until the pain stops and continue for 30 minutes.

4.2. Most important symptoms and effects, both acute and delayed

Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.
Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

4.3. Indication of any immediate medical attention and special treatment needed

No special

Information to medics

Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture

If the product is exposed to high temperatures, as in the case of fire, dangerous catabolic substances are produced. These are: Carbon oxides. Fire will result in thick black smoke. Exposure to catabolic products can damage your health. Fire fighters should use proper protection gear. Closed containers, which are exposed to fire, should be cooled with water. Do not let fire-extinguishing water run into sewers and other water courses. Aerosols may explode if heated / fire.

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Stores that have not ignited must be cooled by water mist. Where possible, remove flammable materials. Make sure there is sufficient ventilation.

6.2. Environmental precautions

Avoid discharge to lakes, streams, sewers, etc. In the event of a leakage to the surroundings, contact the local environmental authorities. Consider putting up waste collecting trays/basins to prevent leakage to the surroundings.

6.3. Methods and material for containment and cleaning up

Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided.

6.4. Reference to other sections

See section on “Disposal considerations ” with regard to the handling of waste. See section on 'Exposure controls/personal protection for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Consider putting up waste collecting trays/basins to prevent leakage to the surroundings. See section on Exposure controls/personal protection for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original. Must be stored in a cool and ventilated area, away from possible sources of combustion.

Storage temperature

50°C

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

▼OEL

dimethyl ether (EH40, 2005)
Long-term exposure limit (8-hour TWA reference period): 400 ppm 766 mg/m3
Short-term exposure limit (15-minute reference period): 500 ppm 958 mg/m3

xylene (EH40, 2005)
Long-term exposure limit (8-hour TWA reference period): 50 ppm 220 mg/m3
Short-term exposure limit (15-minute reference period): 100 ppm 441 mg/m3
Comments: Sk BMGV (Bmgv = Biological Monitoring Guidance Value. Sk = Can be absorbed through skin.)

acetone (EH40, 2005)
Long-term exposure limit (8-hour TWA reference period): 500 ppm 1210 mg/m3
Short-term exposure limit (15-minute reference period): 1500 ppm 3620 mg/m3

Butane (0,1 % butadiene (203-450-8) (EH40/2005, 2005)

Long-term exposure limit (8-hour TWA reference period): 600 ppm 1450 mg/m3
Short-term exposure limit (15-minute reference period): 750 ppm 1810 mg/m3

DNEL / PNEC

DNEL (zinc): 5 mg/m
Exposure: Inhalation
Duration of Exposure: Long term – Systemic effects

DNEL (zinc): 83 mg/kg bw/day
Exposure: Dermal
Duration of Exposure: Long term – Systemic effects
PNEC (zinc): 20.6 g/L
Duration of Exposure: Single

PNEC (zinc): 6.1 g/L
Duration of Exposure: Single

PNEC (zinc): 117.8 mg/kg sediment dw
Duration of Exposure: Single

PNEC (zinc): 56.5 mg/kg sediment dw
Duration of Exposure: Single

PNEC (zinc): 35.6 mg/kg soil dw
Duration of Exposure: Single

8.2. Exposure controls

Compliance with the stated exposure limits values should be checked on a regular basis.

General recommendations

Observe general occupational hygiene.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

Trade users are covered by the rules of the working environment legislation on maximum concentrations for exposure. See work hygiene threshold values below.

Appropriate technical measures

Airborne gas and dust concentrations must be kept as low as possible and below the current threshold values (see below). Use for example an exhaust system if the normal air flow in the work room is not sufficient. Make sure that eyewash and emergency showers are clearly marked.

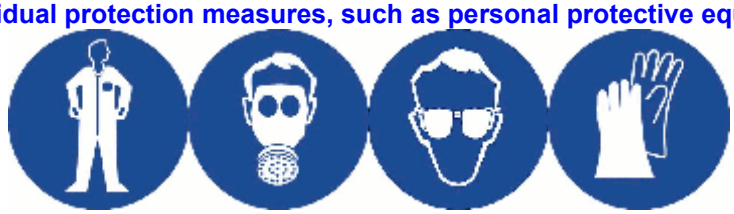
Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment



Generally

Use only CE marked protective equipment.

Respiratory Equipment

The product contains liquids with a low boiling point which are poorly absorbed on charcoal filters. The use of fresh air respiratory protective equipment is thus required. In most cases a mask with an A -filter is adequate, as the product normally is used only for a short period of time.

Skin protection

Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection

Recommended: 4H/Barrier. See the manufacturer s instructions

Eye protection

Use safety glasses with a side shield.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Aerosol	Gray	Characteristic	-	-	1,292

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-	-	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
0	-	-

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Insoluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity
No data available

10.2. Chemical stability
The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions
No special

10.4. Conditions to avoid
Avoid static electricity.

10.5. Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reductants agents.

10.6. Hazardous decomposition products
The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result
dimethyl ether	Rat	LC50	Inhalation	164000
zinc oxide	Mouse	LD50	Oral	7950 mg/kg
zinc oxide	Mouse	LC50	Inhalation	2500 mg/m3
zinc oxide	Rat	LD50	Intraperitoneal	240 mg/kg
zinc	Rat	LD50	Oral	>2000 mg/kg bw
zinc	Rat	LC50	Inhalation	>5.41 mg/m

Skin corrosion/irritation
Causes skin irritation.

Serious eye damage/irritation
No data available.

Respiratory or skin sensitisation
No data available.

Germ cell mutagenicity
No data available.

Carcinogenicity
No data available.

Reproductive toxicity
No data available.

STOT-single exposure
No data available.

STOT-repeated exposure
No data available.

Aspiration hazard
No data available.

Long term effects

Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin s natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.
Irritation effects: This product contains substances which cause irritation to skin and eyes, or when inhaled. Contact with locally irritative substances can cause the area of contact to be more prone to absorb damaging substances such as allergens.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result
zinc oxide	Daphnia	LC50	48 h	2600 g/L
zinc oxide	Fish	LC50	96 h	1100 g/L

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result
No data available.			

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC
Butane (0,1 % butadiene (203-...	No	2,89	No data available

12.4. Mobility in soil

Butane (0,1 % butadiene (203-...: Log Koc= 2,366991, Calculated from LogPow (Moderate mobility potential.).

12.5. Results of PBT and vPvB assessment

No data available

12.6. Other adverse effects

This product contains ecotoxic substances which can have damaging effects on water-organisms. This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

The product is covered by the regulations on dangerous waste.

Waste

EWC code

16 05 04

Specific labelling

-

Contaminated packing

Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID

14.1. UN number	1950
14.2. UN proper shipping name	AEROSOLS, FLAMMABLE
14.3. Transport hazard class(es)	2.1
14.4. Packing group	-
Notes	-
Tunnel restriction code	D

IMDG

UN-no.	1950
Proper Shipping Name	AEROSOLS, FLAMMABLE
Class	2.1
PG*	-
EmS	F-D, S-U

MP** yes
Hazardous constituent Propan, Butan, ylene, Dimethyl Ether,

IATA/ICAO
UN-no.
Proper Shipping Name
Class
PG*

14.5. Environmental hazards

This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

( ) Packing group
( ) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC.

Demands for specific education

-

Additional information

Sources

COUNCIL DIRECTIVE 92/85/EEC on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding.
Council Directive 94/33/EC of 22 June 1994 on the protection of young people at work.
Council Directive 75/324/EEC of 20 May 1975 on the approximation of the laws of the Member States relating to aerosol dispensers.
IDirective 2004/42/CE of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC.
EC Regulation 1272/2008 (CLP).
EC regulation 1907/2006 (REACH).

15.2. Chemical safety assessment

No

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3

H220 - Extremely flammable gas.
H225 - Highly flammable liquid and vapour.
H226 - Flammable liquid and vapour.
H302 - Harmful if swallowed.
H304 - May be fatal if swallowed and enters airways.
H312 - Harmful in contact with skin.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H332 - Harmful if inhaled.
H336 - May cause drowsiness or dizziness.
H400 - Very toxic to aquatic life.
H410 - Very toxic to aquatic life with long lasting effects.
EUH066 - Repeated exposure may cause skin dryness or cracking.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet is validated by

MJH

Date of last essential change
(First cipher in SDS version)

17-06-2015

Date of last minor change
(Last cipher in SDS version)

22-10-2015

SAFETY DATA SHEET

Issue Date 09-Feb-2015 **Revision Date** 09-Feb-2015 **Version** 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier
Product Name Kluberplex AG 11-462

Other means of identification
Product code: 039091
Synonyms None

Recommended use of the chemical and restrictions on use
Recommended Use Lubricant.
Uses advised against Consumer use

Details of the supplier of the safety data sheet
Supplier Address
Kl ber Lubrication NA, LP
32 Industrial Drive
Londonderry, NH 03053
Phone: (603) 647-4104
Fax: (603) 647-4106

Emergency telephone number
Emergency Telephone CHEMTREC: 1-800-424-9300; INTERNATIONAL: (703) 527-3887

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status
This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.122)

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Label elements

EMERGENCY OVERVIEW

The product contains no substances which at their given concentration, are considered to be hazardous to health

Appearance Paste **Physical state** Solid **Odor** Mild

Hazards not otherwise classified (HNOC)
Other information
• Harmful to aquatic life with long lasting effects
Unknown Acute Toxicity
39.842% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

The product contains no substances which at their given concentration, are considered to be hazardous to health.

Components	CAS-No	Weight %	Trade Secret
Mineral oil	Proprietary	40 - 50%	
Zinc sulfide	Proprietary	10 - 20%	

4. FIRST AID MEASURES

First aid measures

Eye contact: Flush eye with water for 15 minutes. If symptoms persist, call a physician.

Skin contact: Rinse with plenty of water. If skin irritation persists, call a physician.

Inhalation: Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. If symptoms persist, call a physician.

Ingestion: Do not induce vomiting. Consult a physician.

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:
Carbon dioxide (CO2). Dry chemical. Dry sand. Water spray mist or foam.

Unsuitable extinguishing media Do not use a solid water stream as it may scatter and spread fire

Specific hazards arising from the chemical
Thermal decomposition can lead to release of irritating gases and vapors. Water may be used to cool closed containers.

Hazardous combustion products Carbon oxides. Nitrogen oxides (NOx). Oxides of sulfur.

Explosion data
Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

Special protective equipment for firefighters:
In the event of fire and/or explosion do not breathe fumes. In the event of fire, wear self-contained breathing apparatus. Standard procedure for chemical fires.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions: Contaminated surfaces will be extremely slippery. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.

Environmental precautions

Environmental precautions: Do not allow material to contaminate ground water system. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up: Scrape-up. Pick up and transfer to properly labelled containers. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Avoid contact with eyes and skin. Do not breathe vapors or spray mist. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place. Keep cool. Keep in properly labelled containers. Keep away from heat and sources of ignition. Handle and open container with care

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines .

Components	ACGIH TLV	OSHA (TWA mg/m ^{3}):	IDLH:
Mineral oil -	5 mg/m ^{3} (oil mist)	5 mg/m ^{3} (oil mist)	

Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Respiratory protection: No personal respiratory protective equipment normally required.
Hand protection: Gloves made of plastic or rubber
Eye protection: Avoid contact with eyes.
Skin and body protection: Usual safety precautions while handling the product will provide adequate protection against this potential effect
General Hygiene Considerations Avoid contact with skin, eyes and clothing

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Solid
Appearance Paste **Odor** Mild **Color** White **Odor threshold** No information available

Property	Values	Remarks • Method	Property	Values
Melting point/freezing point	No information available		**pH**	Not applicable
			Boiling point / boiling range	No information available
Flash point	Not Applicable	ISO 2592	**Evaporation rate**	No information available
Flammability (solid, gas)	No information available		**Flammability Limit in Air**	
Upper flammability limit:	No information available		**Lower flammability limit:**	No information available
Vapor pressure	0.001 hPa, 20 °C		**Vapor density**	No information available
Specific Gravity	1.07		**Water solubility**	Insoluble in water
Solubility in other solvents	No information available		**Partition coefficient**	No information available
Autoignition temperature	No information available		**Decomposition temperature**	No information available

Kinematic viscosity	No information available	**Dynamic viscosity**	No information available
Explosive properties	No information available		
Oxidizing properties	No information available		

Other information

Softening point	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Density	No information available
Bulk density	No information available

10. STABILITY AND REACTIVITY

Reactivity
Not applicable

Chemical stability

Stability Stable under normal conditions

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid

Conditions to avoid Heat, flames and sparks

Hazardous Decomposition Products

Hazardous Decomposition Products None under normal processing

Incompatible materials

Incompatible materials Strong oxidising agents

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information Product does not present an acute toxicity hazard based on known or supplied information

Eye contact Contact with eyes may cause irritation.

Skin contact Prolonged contact may cause redness and irritation.

Inhalation Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract.

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Components	Oral LD50	Dermal LD50	Inhalation LC50
Zinc sulfide -	-	-	> 5040 mg/m³ (Rat) 4 h

Information on toxicological effects

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization	No sensitization responses were observed.
Mutagenic effects:	Did not show mutagenic or teratogenic effects in animal experiments.
Carcinogenicity	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Reproductive toxicity	This product does not contain any known or suspected reproductive hazards.
STOT - Single Exposure	None under normal use conditions.
STOT - Repeated Exposure	None under normal use conditions.
Aspiration hazard	Not applicable.

Numerical measures of toxicity - Product Information

Unknown Acute Toxicity	39.842% of the mixture consists of ingredient(s) of unknown toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral)	5361 mg/kg
ATEmix (dermal)	2359 mg/kg

12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life with long lasting effects

39.462% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Persistence and degradability
No information available.

Bioaccumulation
No information available.

Mobility
No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes	Disposal should be in accordance with applicable regional, national and local laws and regulations.
Contaminated packaging	Empty containers should be taken for local recycling, recovery or waste disposal.

14. TRANSPORT INFORMATION

DOT	Not Regulated by any means of transportation

15. REGULATORY INFORMATION

International Inventories

TSCA:	Listed in TSCA
DSL:	Not listed in DSL
EINECS/ELINCS	This product complies with EINECS/ELINCS
CHINA:	This product does not comply with China IECSC.
KECL:	This product does not comply with Korea KECL.

PICCS: This product does not comply with Philippines PICCS.
AICS: This product does not comply with Australia AICS

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Components	SARA 313 Threshold:
Zinc sulfide	Zinc compound (1%)

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

State Regulations (RTK)

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Components	NJRTK:	MARTK:	PARTK:
Mineral oil -	Substance no. 1437 Listed. Substance no. 4004 Listed.	Not Listed	Not Listed
Zinc sulfide -	Substance no. 3012 Listed	Not Listed	Listed

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION

Nfpa:
Health: 1
Flammability: 1
Instability 0
NFPA/HMIS * for Carc, Muta, Tera, Specific Organ
HMIS health rating:
Health: 1
Flammability: 1
Physical hazards 0
Personal protection B

Issue Date 09-Feb-2015
Revision Date 09-Feb-2015
Revision Note
Not applicable

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

SAFETY DATA SHEET

Issue Date 21-Jan-2015 **Revision Date** 21-Jan-2015 **Version** 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier
Product Name Kl berplex BEM 41-141

Other means of identification
Product code: 020320
Synonyms None

Recommended use of the chemical and restrictions on use
Recommended Use Lubricant.
Uses advised against Consumer use

Details of the supplier of the safety data sheet
Supplier Address
Kl ber Lubrication NA, LP
32 Industrial Drive
Londonderry, NH 03053
Phone: (603) 647-4104
Fax: (603) 647-4106

Emergency telephone number
Emergency Telephone CHEMTREC: 1-800-424-9300; INTERNATIONAL: (703) 527-3887

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status
This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.122)

Not a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Label elements

EMERGENCY OVERVIEW

The product contains no substances which at their given concentration, are considered to be hazardous to health

Appearance Paste **Physical state** Solid **Odor** Mild

Hazards not otherwise classified (HNOC)
Other information
Unknown Acute Toxicity
17.50566% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

The product contains no substances which at their given concentration, are considered to be hazardous to health.

Components	CAS-No	Weight %	Trade Secret
Molybdenum complex	Proprietary	1-5	

4. FIRST AID MEASURES

First aid measures

Eye contact: Flush eye with water for 15 minutes. If symptoms persist, call a physician.

Skin contact: Rinse with plenty of water. If skin irritation persists, call a physician.

Inhalation: Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. If symptoms persist, call a physician.

Ingestion: Do not induce vomiting. Consult a physician.

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:
Carbon dioxide (CO2). Dry chemical. Dry sand. Water spray mist or foam.

Unsuitable extinguishing media Do not use a solid water stream as it may scatter and spread fire

Specific hazards arising from the chemical
Thermal decomposition can lead to release of irritating gases and vapors. Water may be used to cool closed containers.

Explosion data
Sensitivity to Mechanical Impact None.
Sensitivity to Static Discharge None.

Special protective equipment for firefighters:
In the event of fire and/or explosion do not breathe fumes. In the event of fire, wear self-contained breathing apparatus. Standard procedure for chemical fires.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions: Contaminated surfaces will be extremely slippery. Avoid contact with skin, eyes and clothing. Wear personal protective equipment.

Environmental precautions

Environmental precautions: Do not allow material to contaminate ground water system. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up: Scrape-up. Pick up and transfer to properly labelled containers. Clean contaminated surface thoroughly. Soak up with oil absorbent material.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling Spilling onto the container s outside will make container slippery. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place. Keep cool. Keep in properly labelled containers. Keep away from heat and sources of ignition

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines Contains mineral oil, vegetable oil, and/or synthetic oil. Under conditions which may generate mists, observe the OSHA PEL of 5 mg/m^3, ACGIH STEL of 10 mg/m^3.

Components	ACGIH TLV	OSHA (TWA mg/m^3):	IDLH:
Molybdenum complex -	-	15 mg/m^3 (molybdenum compound)	

Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Respiratory protection: No personal respiratory protective equipment normally required.
Hand protection: Impervious gloves
Eye protection: Safety glasses with side-shields. Avoid contact with eyes.
Skin and body protection: Usual safety precautions while handling the product will provide adequate protection against this potential effect
General Hygiene Considerations Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Solid
Appearance Paste **Odor** Mild **Color** Yellow **Odor threshold** No information available

Property	Values	Remarks • Method	Property	Values
Melting point/freezing point	No information available		**pH**	Not applicable
			Boiling point / boiling range	No information available
Flash point	Not Applicable	ISO 2592	**Evaporation rate**	No information available
Flammability (solid, gas)	No information available		**Flammability Limit in Air**	
Upper flammability limit:	No information available		**Lower flammability limit:**	No information available
Vapor pressure	0.001 hPa, 20 °C		**Vapor density**	No information available
Specific Gravity	0.88		**Water solubility**	Insoluble in water
Solubility in other solvents	No information available		**Partition coefficient**	No information available
Autoignition temperature	No information available		**Decomposition temperature**	No information available
Kinematic viscosity	No information available		**Dynamic viscosity**	No information available
Explosive properties	No information available			

Oxidizing properties	No information available

Other information

Softening point	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Density	No information available
Bulk density	No information available

10. STABILITY AND REACTIVITY

Reactivity
Not applicable

Chemical stability

Stability Stable under normal conditions

Possibility of Hazardous Reactions

Possibility of Hazardous Reactions None under normal processing.

Hazardous polymerization Hazardous polymerization does not occur.

Conditions to avoid

Conditions to avoid Heat, flames and sparks

Hazardous Decomposition Products

Hazardous Decomposition Products None under normal processing

Incompatible materials

Incompatible materials Strong oxidising agents

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information Product does not present an acute toxicity hazard based on known or supplied information

Eye contact Contact with eyes may cause irritation.

Skin contact Prolonged contact may cause redness and irritation.

Inhalation Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract.

Ingestion Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

Information on toxicological effects

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization	No sensitization responses were observed.
Mutagenic effects:	Did not show mutagenic or teratogenic effects in animal experiments.
Carcinogenicity	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.
Reproductive toxicity	This product does not contain any known or suspected reproductive hazards.
STOT - Single Exposure	None under normal use conditions.
STOT - Repeated Exposure	None under normal use conditions.
Aspiration hazard	Not applicable.

Numerical measures of toxicity - Product Information

Unknown Acute Toxicity 17.50566% of the mixture consists of ingredient(s) of unknown toxicity
The following values are calculated based on chapter 3.1 of the GHS document .
ATEmix (oral) 6171 mg/kg
ATEmix (dermal) 3739 mg/kg
ATEmix (inhalation-dust/mist) 9.5 mg/l

12. ECOLOGICAL INFORMATION

Ecotoxicity

No known hazards to the aquatic environment.

16.576% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Persistence and degradability
No information available.

Bioaccumulation
No information available.

Mobility
The product is insoluble and floats on water.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of wastes Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging Empty containers should be taken for local recycling, recovery or waste disposal.

14. TRANSPORT INFORMATION

DOT Not Regulated by any means of transportation

15. REGULATORY INFORMATION

International Inventories

TSCA: Listed in TSCA
DSL: All of the components in this product are listed in DSL
EINECS/ELINCS This product complies with EINECS/ELINCS
CHINA: This product complies with China IECSC.
KECL: This product does not comply with Korea KECL.
PICCS: This product does not comply with Philippines PICCS.
AICS: All the constituents of this material are listed on the Australian AICS

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

State Regulations (RTK)

California Proposition 65
This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

U.S. EPA Label Information
EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION

Nfpa:
Health: 1
Flammability: 1
Instability 0
NFPA/HMIS * for Carc, Muta, Tera, Specific Organ
HMIS health rating:
Health: 1
Flammability: 1
Physical hazards 0
Personal protection B

Issue Date	21-Jan-2015
Revision Date	21-Jan-2015

Revision Note
Not applicable

Disclaimer

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End of Safety Data Sheet

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 18.03.2010 Revision: 03.03.2009

*
1 Identification of the substance/preparation and of the company/undertaking

· **Product details**

· **Trade name: Klübersynth GEM 4-220N**

· **Article number:** 012234
· **Application of the substance / the preparation** Lubricating oil

· **Manufacturer/Supplier:**
KLÜBER LUBRICATION MÜNCHEN KG
Geisenhausenerstrasse 7
D-81379 München
Tel.: 0049 (0) 897876-0
Fax: 0049 (0) 897876-333

· **Further information obtainable from:**
Material Compliance Management
E-Mail: mcm@klueber.com

· **Information in case of emergency:** 0049 (0) 89 7876 700 (24 hrs)

*
2 Hazards identification

· **Hazard description:** Not applicable.
· **Information concerning particular hazards for human and environment:**
The product does not have to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
· **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

*
3 Composition/information on ingredients

· **Chemical characterization**
· **Description:**
Synthetic hydrocarbon oil
ester oil

· **Dangerous components:** Void
· **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First-aid measures

· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Wash off with soap and plenty of water.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.

5 Fire-fighting measures

· **Suitable extinguishing agents:**
Water haze

(Contd. on page 2)

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 18.03.2010 Revision: 03.03.2009

Trade name: Klübersynth GEM 4-220N

(Contd. of page 1)

Foam
Fire-extinguishing powder
Carbon dioxide
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards caused by the substance, its products of combustion or resulting gases:**
In case of fire, the following can be released:
Carbon monoxide (CO)
Hydrocarbons
· **Protective equipment:**
Do not inhale explosion gases or combustion gases.
Standard procedure for chemical fires.
· **Additional information**
Cool endangered receptacles with water spray.
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Person-related safety precautions:** Particular danger of slipping on leaked/spilled product.
· **Measures for environmental protection:** Do not allow to enter sewers/ surface or ground water.
· **Measures for cleaning/collecting:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of the material collected according to regulations.

7 Handling and storage

· **Handling:**
· **Information for safe handling:** Prevent formation of aerosols.
· **Information about fire - and explosion protection:** No special measures required.

· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Store in cool, dry conditions in well sealed receptacles.
· **Information about storage in one common storage facility:**
Store away from foodstuffs.
Store away from oxidizing agents.
· **Further information about storage conditions:** None.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **Ingredients with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
· **Additional information:** The lists valid during the making were used as basis.

· **Personal protective equipment:**
· **General protective and hygienic measures:**
Do not inhale gases / fumes / aerosols.
Immediately remove all soiled and contaminated clothing
Avoid close or long term contact with the skin.
Be sure to clean skin thoroughly after work and before breaks.
· **Protection of hands:** Preventive skin protection by use of skin-protecting agents is recommended.
· **Eye protection:** Goggles recommended during refilling

(Contd. on page 3)

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 18.03.2010 Revision: 03.03.2009

Trade name: Klübersynth GEM 4-220N

(Contd. of page 2)

*
9 Physical and chemical properties

· **General Information**

Form:	Fluid
Colour:	Light yellow
Odour:	Product specific

· **Change in condition**

Pour point	~ - 40°C (DIN ISO 3016)

· **Flash point:** > 200°C (DIN ISO 2592)

· **Danger of explosion:** Product does not present an explosion hazard.

· **Density at 20°C:** ~ 0.85 g/cm³ (DIN 51757)

· **Solubility in / Miscibility with water:** Insoluble.

· **Viscosity:**

Kinematic at 40°C:	~ 220 mm²/s (DIN 51562)

10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
· **Materials to be avoided:** oxidizing agents
· **Dangerous reactions** No dangerous reactions known.
· **Dangerous decomposition products:** none under normal use

11 Toxicological information

· **Additional toxicological information:**
Prolonged skin contact may cause skin irritation and/or dermatitis.

*
12 Ecological information

· **Ecotoxical effects:**
· **Behaviour in sewage processing plants:** The product can be mechanically separated.
· **General notes:** Do not allow product to reach ground water, water course or sewage system.

13 Disposal considerations

· **Product:**
· **Recommendation** Can be incinerated in accordance with local and national regulations.
· **Waste disposal key:**
For this product no waste disposal key according the European Waste Catalogue (EWC) can be determined, as only the purpose of application defined by the user enables an allocation. The waste code number has to be determined in accordance with the local waste disposer.

· **Uncleaned packaging:**
· **Recommendation:**
Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.

(Contd. on page 4)

Safety Data Sheet
according to 1907/2006/EC, Article 31

Printing date 18.03.2010 Revision: 03.03.2009

Trade name: Klübersynth GEM 4-220N

(Contd. of page 3)

14 Transport information

· **Land transport ADR/RID (cross-border)**
· **ADR/RID class:** -

· **Maritime transport IMDG:**
· **IMDG Class:** -

· **Air transport ICAO-TI and IATA-DGR:**
· **ICAO/IATA Class:** -

· **Transport/Additional information:**
Not classified as dangerous according to the above specifications.

*
15 Regulatory information

· **Labelling according to EU guidelines:**
The product is not subject to classification according to the calculation methods of the "General Classification Guideline for Preparations of the EU" as issued in the latest valid version.

· **National regulations:**

· **Other regulations, limitations and prohibitive regulations**

· **Substances of very high concern (SVHC) according to REACH, Article 57**
None of the ingredients is listed.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing MSDS:** Material Compliance Management
· **Contact:** +49(0)897876-1564
· *** Data compared to the previous version altered.**

Revision Number: 005.0 **Issue date:** 06/07/2013

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite 243**
Product type: Anaerobic Sealant

IDH number: 230760
Item number: 24300
Region: United States

Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

Contact information:
Telephone: 860.571.5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state: Liquid
Color: Blue
Odor: Characteristic

HEALTH: 2
FLAMMABILITY: 1
PHYSICAL HAZARD: 1
Personal Protection: See MSDS Section 8

WARNING: MAY CAUSE ALLERGIC SKIN REACTION.
MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.

Relevant routes of exposure: Skin, Lungs, Eyes

Potential Health Effects

Inhalation: May cause respiratory tract irritation.
Skin contact: May cause skin irritation. May cause allergic skin reaction.
Eye contact: Contact with eyes will cause irritation.
Ingestion: Not expected to be harmful by ingestion.

Existing conditions aggravated by exposure: Eye, skin, and respiratory disorders.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Polyglycol dimethacrylate	25852-47-5	60 - 100
Polyglycol dioctanoate	18268-70-7	10 - 30
Amorphous fumed silica	68611-44-9	1 - 5
1-Acetyl-2-phenylhydrazine	114-83-0	0.1 - 1
Cumene	98-82-8	0.1 - 1

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If symptoms develop and persist, get medical attention.

Skin contact: Wash clothing before reuse. If symptoms develop and persist, get medical attention. Remove contaminated clothing and footwear. Wash with soap and water.

Eye contact: Get medical attention. Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time.

Ingestion: Get medical attention. Do not induce vomiting. Keep individual calm.

5. FIRE FIGHTING MEASURES

Flash point: > 93 °C (> 199.4 °F) Tagliabue closed cup

Autoignition temperature: Not available.

Flammable/Explosive limits - lower: Not available.

Flammable/Explosive limits - upper: Not available.

Extinguishing media: If product is involved in fire extinguish with dry powder, foam or carbon dioxide.

Special firefighting procedures: Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.

Unusual fire or explosion hazards: None

Hazardous combustion products: Irritating organic vapours. Oxides of carbon. Oxides of sulfur. Oxides of nitrogen.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Do not allow product to enter sewer or waterways.

Clean-up methods: Store in a partly filled, closed container until disposal. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

7. HANDLING AND STORAGE

Handling: Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling.

Storage: Not available.

For information on product shelf life contact Henkel Customer Service at (800) 243-4874.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyglycol dimethacrylate	None	None	None	None
Polyglycol dioctanoate	None	None	None	None
Amorphous fumed silica	None	None	None	None
1-Acetyl-2-phenylhydrazine	None	None	None	None
Cumene	50 ppm TWA	50 ppm (245 mg/m3) TWA (SKIN)	None	None

Engineering controls: Ensure adequate ventilation. Use general ventilation and use local exhaust, where possible, in confined or enclosed spaces.

Respiratory protection: No personal respiratory protective equipment normally required. If ventilation is not sufficient to effectively prevent buildup of vapor/mist/fume/dust, appropriate NIOSH/MSHA respiratory protection must be provided.

Eye/face protection: Safety goggles or safety glasses with side shields.

Skin protection: Use impermeable gloves and protective clothing as necessary to prevent skin contact. Neoprene gloves. Butyl rubber gloves. Natural rubber gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Blue
Odor:	Characteristic
Odor threshold:	Not available.
pH:	Not applicable
Vapor pressure:	0.1 mm hg (80 °F (26.7 °C))
Boiling point/range:	> 300 °F (> 148.9 °C)
Melting point/ range:	Not available.
Specific gravity:	1.08 at 68 °F (20°C)
Vapor density:	Not available.
Flash point:	> 93 °C (> 199.4 °F) Tagliabue closed cup
Flammable/Explosive limits - lower:	Not available.
Flammable/Explosive limits - upper:	Not available.
Autoignition temperature:	Not available.
Evaporation rate:	Not available.
Solubility in water:	Partially soluble
Partition coefficient (n-octanol/water):	Not available.
VOC content:	0.73 %; 7.21 g/l

10. STABILITY AND REACTIVITY

Stability: Stable

Hazardous reactions: Will not occur.

Hazardous decomposition products: Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours. Oxides of carbon.

Incompatible materials: Strong alkalis. Reducing agents. Oxygen scavengers. Oxidizing agents. Other polymerization initiators. Strong oxidizing agents.

Conditions to avoid: See "Handling and Storage" (Section 7) and "Incompatibility" (Section 10).

11. TOXICOLOGICAL INFORMATION

Acute oral product toxicity: LD50 (rat) > 10,000 mg/kg

Acute dermal product toxicity: LD50 (rabbit) > 5,000 mg/kg (Estimated)

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyglycol dimethacrylate	No	No	No
Polyglycol dioctanoate	No	No	No
Amorphous fumed silica	No	No	No
1-Acetyl-2-phenylhydrazine	No	No	No
Cumene	No	Group 2B	No

Hazardous components	Health Effects/Target Organs
Polyglycol dimethacrylate	Irritant, Allergen
Polyglycol dioctanoate	Irritant
Amorphous fumed silica	No Target Organs
1-Acetyl-2-phenylhydrazine	Allergen, Blood, Kidney, Mutagen, Some evidence of carcinogenicity
Cumene	Central nervous system, Irritant, Lung

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12(b) Export Notification: None above reporting de minimus

CERCLA/SARA Section 302 EHS: None above reporting de minimis
CERCLA/SARA Section 311/312: Immediate Health, Delayed Health
CERCLA/SARA 313: None above reporting de minimis

California Proposition 65: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. This product contains a chemical known in the State of California to cause cancer.

Canada Regulatory Information

CEPA DSL/NDSL Status: All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
WHMIS hazard class: D.2.A, D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: 3, 8, 11, 15

Prepared by: Kyra Kozak Woods, Manager, Regulatory Affairs

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Revision Number: 006.0 **Issue date:** 06/12/2014

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **LOCTITE 270 (Old)**
Product type: Anaerobic Sealant

IDH number: 230401
Item number: 23725
Region: United States

Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

Contact information:
Telephone: 860.571.5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state: Liquid
Color: Green
Odor: Mild

HEALTH: 2
FLAMMABILITY: 1
PHYSICAL HAZARD: 1
Personal Protection: See MSDS Section 8

WARNING: CAUSES EYE IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.
MAY CAUSE SKIN AND RESPIRATORY TRACT IRRITATION.

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation: May cause respiratory tract irritation.
Skin contact: May cause allergic skin reaction. May cause skin irritation.
Eye contact: Contact with eyes will cause irritation.
Ingestion: Not expected to be harmful by ingestion.

Existing conditions aggravated by exposure: Eye, skin, and respiratory disorders.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Polyglycol dimethacrylate	25852-47-5	60 - 100
Bisphenol A fumarate resin	39382-25-7	10 - 30
Saccharin	81-07-2	1 - 5
Cumene hydroperoxide	80-15-9	1 - 5
Cumene	98-82-8	0.1 - 1

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If symptoms develop and persist, get medical attention.

Skin contact: Wash with soap and water. Remove contaminated clothing and footwear. Wash clothing before reuse. If symptoms develop and persist, get medical attention.

Eye contact: Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Get medical attention.

Ingestion: Do not induce vomiting. Keep individual calm. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point: > 93 °C (> 199.4 °F) Tagliabue closed cup

Autoignition temperature: Not available.

Flammable/Explosive limits - lower: Not available.

Flammable/Explosive limits - upper: Not available.

Extinguishing media: Foam, dry chemical or carbon dioxide.

Special firefighting procedures: Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.

Unusual fire or explosion hazards: Not available.

Hazardous combustion products: Oxides of carbon. Irritating organic vapours.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Do not allow product to enter sewer or waterways.

Clean-up methods: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Store in a partly filled, closed container until disposal.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Avoid breathing vapors or mists of this product. Wash thoroughly after handling.

Storage: For safe storage, store at or below 38 °C (100.4 °F)
Keep in a cool, well ventilated area away from heat, sparks and open flame.
Keep container tightly closed until ready for use.

For information on product shelf life contact Henkel Customer Service at (800) 243-4874.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyglycol dimethacrylate	None	None	None	None
Bisphenol A fumarate resin	None	None	None	None
Saccharin	None	None	None	None
Cumene hydroperoxide	None	None	1 ppm (6 mg/m3) TWA (SKIN)	None
Cumene	50 ppm TWA	50 ppm (245 mg/m3) PEL (SKIN)	None	None

Engineering controls: No specific ventilation requirements noted, but forced ventilation may still be required if concentrations exceed occupational exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety goggles or safety glasses with side shields.

Skin protection: Use impermeable gloves and protective clothing as necessary to prevent skin contact. Neoprene gloves. Butyl rubber gloves. Natural rubber gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid
Color: Green
Odor: Mild
Odor threshold: Not available.
pH: Not available.
Vapor pressure: 5 mm hg (27 °C (80.6 °F))
Boiling point/range: > 149 °C (> 300.2 °F)
Melting point/ range: Not available.
Specific gravity: 1.10
Vapor density: Not available.
Flash point: > 93 °C (> 199.4 °F) Tagliabue closed cup
Flammable/Explosive limits - lower: Not available.
Flammable/Explosive limits - upper: Not available.
Autoignition temperature: Not available.
Evaporation rate: Not available.
Solubility in water: Slight
Partition coefficient (n-octanol/water): Not available.
VOC content: 8.4 %; 92 g/l

10. STABILITY AND REACTIVITY

Stability: Stable

Hazardous reactions: Will not occur.

Hazardous decomposition products: Oxides of carbon. Irritating organic vapours.

Incompatible materials: Strong oxidizing agents. Strong acids. Strong reducing agents. Free radical initiators.

Conditions to avoid: Not available.

11. TOXICOLOGICAL INFORMATION

Acute oral product toxicity: LD50 (rat) > 5,000 mg/kg (Estimated)

Acute inhalation product toxicity: LD50 (rabbit) > 2000 (Estimated)

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyglycol dimethacrylate	No	No	No
Bisphenol A fumarate resin	No	No	No
Saccharin	No	No	No
Cumene hydroperoxide	No	No	No
Cumene	No	Group 2B	No

Hazardous components	Health Effects/Target Organs
Polyglycol dimethacrylate	Allergen, Irritant
Bisphenol A fumarate resin	No Target Organs
Saccharin	No Target Organs
Cumene hydroperoxide	Allergen, Central nervous system, Corrosive, Irritant, Mutagen
Cumene	Central nervous system, Irritant, Lung

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

The shipping classifications in this sections are for non-bulk packaging only (unless otherwise specified). Shipping classification may be different for bulk packaging.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12 (b) Export Notification:	None above reporting de minimis
CERCLA/SARA Section 302 EHS:	None above reporting de minimis
CERCLA/SARA Section 311/312:	Immediate Health, Delayed Health
CERCLA/SARA Section 313:	This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Saccharin (CAS 81-07-2). Cumene hydroperoxide (CAS 80-15-9).
California Proposition 65:	This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known in the State of California to cause cancer.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
WHMIS hazard class:	D.2.A, D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: 3, 8, 11, 15 and 16

Prepared by: Diane Annis, Sr. Regulatory Affairs Specialist

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Safety Data Sheet according to (EC) No 1907/2006

sds no. : 153465
V003.6

LOCTITE 272

Revision: 23.04.2013
printing date: 18.06.2014

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
LOCTITE 272

1.2. Relevant identified uses of the substance or mixture and uses advised against
Intended use:
Anaerobic Adhesive

1.3. Details of the supplier of the safety data sheet
Henkel Limited
2 Bishop Square Business Park
AL109EY Herfordshire Hatfield

Great Britain

Phone: +44 1606 593933
Fax-no.: +44 1606 863762

ua-productsafety.uk@uk.henkel.com

1.4. Emergency telephone number
24 Hours Emergency Tel: +44 (0)1442 278497

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (DPD):
Sensitizing
R43 May cause sensitisation by skin contact.
Xi - Irritant
R41 Risk of serious damage to eyes.
R37/38 Irritating to respiratory system and skin.

2.2. Label elements

Label elements (DPD):

Xi - Irritant

Risk phrases:
R37/38 Irritating to respiratory system and skin.
R41 Risk of serious damage to eyes.
R43 May cause sensitisation by skin contact.

Safety phrases:
S24/25 Avoid contact with skin and eyes.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 After contact with skin, wash immediately with plenty of water and soap.
S37/39 Wear suitable gloves and eye/face protection.
S51 Use only in well-ventilated areas.

Additional labeling:
For consumer use only: S2 Keep out of the reach of children
S46 If swallowed, seek medical advice immediately and show this container or label.

Contains:
N,N-(m-phenylene)dimaleimide,
Hydroxypropyl methacrylate,
Maleic acid

2.3. Other hazards
This product contains a solid compound, which in powder form is classified as very toxic by inhalation. The product is not labelled accordingly as such exposure can be excluded under normal and foreseeable conditions. In the case that the product is used divergently under formation of aerosols, measures have to be observed to exclude inhalational exposure.

SECTION 3: Composition/information on ingredients

General chemical description:
Methacrylate resin based threadlocker

Declaration of the ingredients according to CLP (EC) No 1272/2008:

Hazardous components CAS-No.	EC Number REACH-Reg No.	content	Classification
N,N-(m-phenylene)dimaleimide 3006-93-7	221-112-8	> 10- < 20 %	Skin irritation 2; Dermal H315 Skin sensitizer 1; Dermal H317 Serious eye damage/eye irritation 1 H318 Acute toxicity 2; Inhalation H330
Hydroxypropyl methacrylate 27813-02-1	248-666-3 01-2119490226-37	> 1- < 5 %	Skin sensitizer 1; Dermal H317 Serious eye irritation 2 H319
Cumene hydroperoxide 80-15-9	201-254-7	> 1- < 2,5 %	Acute toxicity 4; Dermal H312 Specific target organ toxicity - repeated exposure 2 H373 Acute toxicity 3; Inhalation H331 Acute toxicity 4; Oral H302 Organic peroxides E H242 Chronic hazards to the aquatic environment 2 H411 Skin corrosion 1B H314
Maleic acid 110-16-7	203-742-5	> 0,1- < 0,9 %	Acute toxicity 4; Oral H302 Acute toxicity 4; Dermal H312 Skin irritation 2 H315 Skin sensitizer 1 H317 Serious eye irritation 2 H319 Specific target organ toxicity - single exposure 3 H335
Cumene 98-82-8	202-704-5	> 0,1- < 0,9 %	Flammable liquids 3 H226 Aspiration hazard 1 H304 Specific target organ toxicity - single exposure 3 H335 Chronic hazards to the aquatic environment 2 H411
N,N-dimethyl-o-toluidine 609-72-3	210-199-8	> 0,1- < 0,5 %	Acute toxicity 3; Inhalation H331 Acute toxicity 3; Dermal H311 Acute toxicity 3; Oral H301 Specific target organ toxicity - repeated exposure 2 H373 Chronic hazards to the aquatic environment 3 H412

For full text of the H - statements and other abbreviations see section 16 "Other information".
Substances without classification may have community workplace exposure limits available.

Declaration of ingredients according to DPD (EC) No 1999/45:

Hazardous components CAS-No.	EC Number REACH-Reg No.	content	Classification
N,N-(m-phenylene)dimaleimide 3006-93-7	221-112-8	> 10 - < 20 %	T+ - Very toxic; R26 Xi - Irritant; R38 Xi - Irritant; R41 Xi - Irritant; R43
Hydroxypropyl methacrylate 27813-02-1	248-666-3 01-2119490226-37	> 1 - < 5 %	Xi - Irritant; R36, R43
Cumene hydroperoxide 80-15-9	201-254-7	> 1 - < 2,5 %	T - Toxic; R23 Xn - Harmful; R21/22, R48/20/22 O - Oxidizing; R7 C - Corrosive; R34 N - Dangerous for the environment; R51/53
Maleic acid 110-16-7	203-742-5	> 0,1 - < 0,9 %	Xn - Harmful; R21/22 Xi - Irritant; R36/37/38, R43
Cumene 98-82-8	202-704-5	> 0,1 - < 0,9 %	R10 Xn - Harmful; R65 Xi - Irritant; R37 N - Dangerous for the environment; R51/53
N,N-dimethyl-o-toluidine 609-72-3	210-199-8	> 0,1 - < 0,5 %	T - Toxic; R23/24/25 R33 R52/53

For full text of the R-Phrases indicated by codes see section 16 'Other Information'.
Substances without classification may have community workplace exposure limits available.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Move to fresh air. If symptoms persist, seek medical advice.

Skin contact:
Rinse with running water and soap.
Obtain medical attention if irritation persists.

Eye contact:
Rinse immediately with plenty of running water (for 10 minutes), seek medical attention from a specialist.

Ingestion:
Rinse mouth, drink 1-2 glasses of water, do not induce vomiting, consult a doctor.

4.2. Most important symptoms and effects, both acute and delayed
EYE: Irritation, conjunctivitis.

SKIN: Redness, inflammation.

RESPIRATORY: Irritation, coughing, shortness of breath, chest tightness.

SKIN: Rash, Urticaria.

4.3. Indication of any immediate medical attention and special treatment needed
See section: Description of first aid measures

SECTION 5: Firefighting measures

Combustion behaviour:
Non flammable product (flash point is greater than 100°C (CC))

5.1. Extinguishing media
Suitable extinguishing media:
Carbon dioxide, foam, powder

Extinguishing media which must not be used for safety reasons:
High pressure waterjet

5.2. Special hazards arising from the substance or mixture
Trace amounts of toxic and/or irritating fumes may be released and the use of breathing apparatus is recommended.

5.3. Advice for firefighters
Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Avoid skin and eye contact.

6.2. Environmental precautions
Do not let product enter drains.

6.3. Methods and material for containment and cleaning up
For small spills wipe up with paper towel and place in container for disposal.
For large spills absorb onto inert absorbent material and place in sealed container for disposal.

6.4. Reference to other sections
See advice in chapter 8

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Use only in well-ventilated areas.
Avoid skin and eye contact.
Prolonged or repeated skin contact should be avoided to minimise any risk of sensitisation.

Hygiene measures:
Good industrial hygiene practices should be observed.
Wash hands before work breaks and after finishing work.
Do not eat, drink or smoke while working.

7.2. Conditions for safe storage, including any incompatibilities
Store in original containers at 8-21°C (46.4-69.8°F) and do not return residual materials to containers as contamination may reduce the shelf life of the bulk product.

7.3. Specific end use(s)
Anaerobic Adhesive

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits

Valid for
Great Britain

Ingredient	ppm	mg/m³	Type	Category	Remarks
CUMENE 98-82-8			Skin designation:	Can be absorbed through the skin.	EH40 WEL
CUMENE 98-82-8	50	250	Short Term Exposure Limit (STEL):		EH40 WEL
CUMENE 98-82-8	25	125	Time Weighted Average (TWA):		EH40 WEL
CUMENE 98-82-8	50	250	Short Term Exposure Limit (STEL):	Indicative	ECTLV
CUMENE 98-82-8	20	100	Time Weighted Average (TWA):	Indicative	ECTLV

Biological Exposure Indices:
None

8.2. Exposure controls:

Respiratory protection:
Use only in well-ventilated areas.
An approved mask or respirator fitted with an organic vapour cartridge should be worn if the product is used in a poorly ventilated area
Filter type: A

Hand protection:
Chemical-resistant protective gloves (EN 374).
Suitable materials for short-term contact or splashes (recommended: at least protection index 2, corresponding to > 30 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced.

Eye protection:
Wear protective glasses.

Skin protection:
Wear suitable protective clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	liquid Orange-red
Odor	characteristic
Odour threshold	No data available / Not applicable
pH ()	3 - 6
Initial boiling point	Not determined

Flash point	> 93,3 °C (> 199.94 °F); Tagliabue closed cup
Decomposition temperature	No data available / Not applicable
Vapour pressure (25 °C (77 °F))	< 0,13 mbar
Density	No data available / Not applicable
Bulk density	No data available / Not applicable
Viscosity	No data available / Not applicable
Viscosity (kinematic)	No data available / Not applicable
Explosive properties	No data available / Not applicable
Solubility (qualitative) (Solvent: Water)	Slight
Solubility (qualitative) (Solvent: Acetone)	Partially miscible
Solidification temperature	No data available / Not applicable
Melting point	No data available / Not applicable
Flammability	No data available / Not applicable
Auto-ignition temperature	No data available / Not applicable
Explosive limits	No data available / Not applicable
Partition coefficient: n-octanol/water	No data available / Not applicable
Evaporation rate	No data available / Not applicable
Vapor density	No data available / Not applicable
Oxidising properties	No data available / Not applicable

9.2. Other information

No data available / Not applicable

SECTION 10: Stability and reactivity

10.1. Reactivity
Reducing agents.
Strong oxidizing agents.

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
See section reactivity

10.4. Conditions to avoid
No decomposition if stored and applied as directed.

10.5. Incompatible materials
None if used properly.

10.6. Hazardous decomposition products
None known

SECTION 11: Toxicological information

11.1. Information on toxicological effects

General toxicological information:
The preparation is classified based on the conventional method outlined in Article 6(1)(a) of Directive 1999/45/EC. Relevant available health/ecological information for the substances listed under Section 3 is provided in the following.

Oral toxicity:
May cause irritation to the digestive tract.

Inhalative toxicity:
Irritating to respiratory system

Skin irritation:
It is irritating and sensitising to the skin

Eye irritation:

The product may cause serious eye damage.
Avoid eye contact.

Acute oral toxicity:

Hazardous components CAS-No.	Value type	Value	Route of application	Exposure time	Species	Method
Cumene hydroperoxide 80-15-9	LD50	550 mg/kg	oral		rat	

Skin corrosion/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Cumene hydroperoxide 80-15-9	corrosive		rabbit	

Germ cell mutagenicity:

Hazardous components CAS-No.	Result	Type of study / Route of administration	Metabolic activation / Exposure time	Species	Method
Cumene hydroperoxide 80-15-9	positive	bacterial reverse mutation assay (e.g Ames test)	without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Cumene hydroperoxide 80-15-9	negative	dermal		mouse	

SECTION 12: Ecological information

General ecological information:

The preparation is classified based on the conventional method outlined in Article 6(1)(a) of Directive 1999/45/EC. Relevant available health/ecological information for the substances listed under Section 3 is provided in the following.
Biodegradable product of low ecotoxicity.
Cured Loctite products are typical polymers and do not pose any immediate environmental hazards.
Biological and Chemical Oxygen Demands (BOD and COD) are insignificant.

12.1. Toxicity

Ecotoxicity:

Do not empty into drains / surface water / ground water.

Hazardous components CAS-No.	Value type	Value	Acute Toxicity Study	Exposure time	Species	Method
Hydroxypropyl methacrylate 27813-02-1	LC50	493 mg/l	Fish	48 h	Leuciscus idus melanotus	
Cumene hydroperoxide 80-15-9	LC50	3,9 mg/l	Fish	96 h	Oncorhynchus mykiss	OECD Guideline 203 (Fish, Acute Toxicity Test)
Cumene hydroperoxide 80-15-9	EC50	18 mg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Cumene hydroperoxide 80-15-9	ErC50	3,1 mg/l	Algae	72 h	Pseudokirchnerella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
Maleic acid 110-16-7	LC50	> 245 mg/l	Fish	48 h	Leuciscus idus	
Maleic acid 110-16-7	EC50	245 mg/l	Daphnia	24 h	Daphnia magna	
Cumene 98-82-8	LC50	4,8 mg/l	Fish	96 h	Oncorhynchus mykiss	OECD Guideline 203 (Fish, Acute Toxicity Test)
Cumene 98-82-8	EC50	4 mg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Cumene 98-82-8	EC50	2,6 mg/l	Algae	72 h	Selenastrum capricornutum (new name: Pseudokirchnerella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)

12.2. Persistence and degradability

Persistence and Biodegradability:
The product is not biodegradable.

Hazardous components CAS-No.	Result	Route of application	Degradability	Method
Hydroxypropyl methacrylate 27813-02-1	readily biodegradable	aerobic	94,2 %	OECD Guideline 301 E (Ready biodegradability: Modified OECD Screening Test)
Cumene hydroperoxide 80-15-9			18 %	OECD Guideline 301 E (Ready biodegradability: Modified OECD Screening Test)
Maleic acid 110-16-7	readily biodegradable	aerobic	87 - 88 %	EU Method C.4-E (Determination of the "Ready" BiodegradabilityClosed Bottle Test)
Cumene 98-82-8		aerobic	86 %	

12.3. Bioaccumulative potential / 12.4. Mobility in soil

Mobility:
Cured adhesives are immobile.

Bioaccumulative potential:
No data available.

Hazardous components CAS-No.	LogKow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method

Hydroxypropyl methacrylate 27813-02-1	0,97					
Cumene hydroperoxide 80-15-9 Cumene hydroperoxide 80-15-9	 2,16	9,1		calculation		OECD Guideline 305 (Bioconcentration: Flow-through Fish Test)
Maleic acid 110-16-7	-0,48					
Cumene 98-82-8 Cumene 98-82-8	 3,55	35,5		Carassius auratus	 23 °C	OECD Guideline 305 (Bioconcentration: Flow-through Fish Test) OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)

12.5. Results of PBT and vPvB assessment

No data available.

12.6. Other adverse effects

No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product disposal:

Dispose of in accordance with local and national regulations.
Contribution of this product to waste is very insignificant in comparison to article in which it is used

Disposal of uncleaned packages:

After use, tubes, cartons and bottles containing residual product should be disposed of as chemically contaminated waste in an authorised legal land fill site or incinerated.
Disposal must be made according to official regulations.

Waste code

08 04 09 waste adhesives and sealants containing organic solvents and other dangerous substances

SECTION 14: Transport information

14.1. UN number

Not hazardous according to RID, ADR, ADNR, IMDG, IATA-DGR.

14.2. UN proper shipping name

Not hazardous according to RID, ADR, ADNR, IMDG, IATA-DGR.

14.3. Transport hazard class(es)

Not hazardous according to RID, ADR, ADNR, IMDG, IATA-DGR.

14.4. Packaging group

Not hazardous according to RID, ADR, ADNR, IMDG, IATA-DGR.

14.5. Environmental hazards

Not hazardous according to RID, ADR, ADNR, IMDG, IATA-DGR.

14.6. Special precautions for user

Not hazardous according to RID, ADR, ADNR, IMDG, IATA-DGR.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

VOC content (1999/13/EC) < 3 %

15.2. Chemical safety assessment

A chemical safety assessment has not been carried out.

SECTION 16: Other information

The labelling of the product is indicated in Section 2. The full text
of all abbreviations indicated by codes in this safety data sheet are as follows:

R10 Flammable.
R21/22 Harmful in contact with skin and if swallowed.
R23 Toxic by inhalation.
R23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
R26 Very toxic by inhalation.
R33 Danger of cumulative effects.
R34 Causes burns.
R36 Irritating to eyes.
R36/37/38 Irritating to eyes, respiratory system and skin.
R37 Irritating to respiratory system.
R38 Irritating to skin.
R41 Risk of serious damage to eyes.
R43 May cause sensitisation by skin contact.
R48/20/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65 Harmful: may cause lung damage if swallowed.
R7 May cause fire.
H226 Flammable liquid and vapor.
H242 Heating may cause a fire.
H301 Toxic if swallowed.
H302 Harmful if swallowed.
H304 May be fatal if swallowed and enters airways.
H311 Toxic in contact with skin.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H330 Fatal if inhaled.
H331 Toxic if inhaled.
H335 May cause respiratory irritation.
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.
H412 Harmful to aquatic life with long lasting effects.

Further information:

This information is based on our current level of knowledge and relates to the product in the state in which it is delivered. It is intended to describe our products from the point of view of safety requirements and is not intended to guarantee any particular properties.

Revision Number: 012.0

Issue date: 08/08/2014

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite(R) 401 Instant Adhesive Prism(R) Surface Insensitive**
IDH number: 253211
Product type: Cyanoacrylate
Item number: 33245
Restriction of Use: None identified
Region: United States

Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

Contact information:
Telephone: (860) 571-5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING: BONDS SKIN IN SECONDS.
COMBUSTIBLE LIQUID.
CAUSES EYE IRRITATION.
MAY CAUSE RESPIRATORY IRRITATION.

HAZARD CLASS	HAZARD CATEGORY
FLAMMABLE LIQUID	4
EYE IRRITATION	2B
SPECIFIC TARGET ORGAN TO ICITY - SINGLE E POSURE	3

PICTOGRAM(S)

Precautionary Statements

Prevention: Keep away from heat,sparks, open flames, hot surfaces - no smoking. Avoid breathing vapors, mist, or spray. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves, eye protection, and face protection.

Response: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to remove. Continue rinsing. Call a poison control center or physician if you feel unwell. If eye irritation persists: Get medical attention. In case of fire: Use foam, dry chemical or carbon dioxide to extinguish.

Storage: Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.

Disposal: Dispose of contents and/or container according to Federal, State/Provincial and local governmental regulations.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Ethyl 2-cyanoacrylate	7085-85-0	60 - 100
Thickener	Proprietary	5 - 10

Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Skin contact: Do not pull bonded skin apart. Soak in warm soapy water. Gently peel apart using a blunt instrument. If skin is burned due to the rapid generation of heat by a large drop, seek medical attention. If lips are bonded, apply warm water to the lips and encourage wetting and pressure from saliva in mouth. Peel or roll lips apart. Do not pull lips apart with direct opposing force.

Eye contact: Immediately flush with plenty of water for at least 15 minutes. Get medical attention. If eyelids are bonded closed, release eyelashes with warm water by covering with a wet pad. Do not force eye open. Cyanoacrylate will bond to eye protein and will cause a lachrymatory effect which will help to debond the adhesive. Keep eye covered until debonding is complete, usually within 1-3 days. Medical attention should be sought in case solid particles of polymerized cyanoacrylate trapped behind the eyelid caused abrasive damage.

Ingestion: Ensure breathing passages are not obstructed. The product will polymerize rapidly and bond to the mouth making it almost impossible to swallow. Saliva will separate any solidified product in several hours. Prevent the patient from swallowing any separated mass.

Symptoms: See Section 11.

Notes to physician: Surgery is not necessary to separate accidentally bonded tissues. Experience has shown that bonded tissues are best treated by passive, non-surgical first aid. If rapid curing has caused thermal burns they should be treated symptomatically after adhesive is removed.

5. FIRE FIGHTING MEASURES

Extinguishing media: Water spray (fog), foam, dry chemical or carbon dioxide.

Special firefighting procedures: Wear a self-contained breathing apparatus with a full face piece operated in pressure-demand or other positive pressure mode.

Unusual fire or explosion hazards: None

Hazardous combustion products: Trace amounts of toxic and/or irritating fumes may be released and the use of breathing apparatus is recommended.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Ventilate area. Do not allow product to enter sewer or waterways.

Clean-up methods: Do not use cloths for mopping up. Flood with water to complete polymerization and scrape off the floor. Cured material can be disposed of as non-hazardous waste. Refer to Section 8 "Exposure Controls / Personal Protection" prior to clean up.

7. HANDLING AND STORAGE

Handling: Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling. Avoid contact with fabric or paper goods. Contact with these materials may cause rapid polymerization which can generate smoke and strong irritating vapors, and cause thermal burns.

Storage: For safe storage, store between 0 °C (32°F) and 10 °C (50°F)
Keep in a cool, well ventilated area away from heat, sparks and open flame.
Keep container tightly closed until ready for use.

For information on product shelf life contact Henkel Customer Service at (800) 243-4874.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Ethyl 2-cyanoacrylate	0.2 ppm TWA	None	None	None
Thickener	None	None	None	None

Engineering controls: Use positive down-draft exhaust ventilation if general ventilation is insufficient to maintain vapor concentration below established exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety goggles or safety glasses with side shields. Full face protection should be used if the potential for splashing or spraying of product exists.

Skin protection: Use nitrile gloves and aprons as necessary to prevent contact. Do not use PVC, nylon or cotton.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid
Color: Colorless, Transparent
Odor: Sharp, Irritating
Odor threshold: 1 - 2 ppm
pH: Not applicable
Vapor pressure: 0.2 mm hg
Boiling point/range: > 149 °C (> 300.2 °F)
Melting point/ range: Not determined
Specific gravity: 1.05
Vapor density: 3 Approximately
Flash point: 80 - 93 °C (176°F - 199.4 °F) Tagliabue closed cup
Flammable/Explosive limits - lower: Not determined
Flammable/Explosive limits - upper: Not determined
Autoignition temperature: 485 °C (905°F)
Evaporation rate: Not applicable
Solubility in water: Polymerises in presence of water.
Partition coefficient (n-octanol/water): Not applicable
VOC content: 2 %; 20 g/l (California SCAQMD Method 316B) (Estimated)
Viscosity: Not available.
Decomposition temperature: Not available.

10. STABILITY AND REACTIVITY

Stability: Stable under recommended storage conditions.

Hazardous reactions: Rapid exothermic polymerization will occur in the presence of water, amines, alkalis and alcohols.

Hazardous decomposition products: None

Incompatible materials: Water, amines, alkalis and alcohols.

Reactivity: Not available.

Conditions to avoid: Spontaneous polymerization.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects/Symptoms

Inhalation: May cause respiratory tract irritation. Exposure to vapors above the established exposure limit results in respiratory irritation, which may lead to difficulty in breathing and tightness in the chest.

Skin contact: May cause skin irritation. Bonds skin in seconds. May cause skin irritation. Cyanoacrylates have been reported to cause allergic reaction but due to rapid polymerization at the skin surface, an allergic response is rare. Cyanoacrylates have been reported to cause allergic reaction but due to rapid polymerization at the skin surface, an allergic response is rare. Cyanoacrylates generate heat on solidification. In rare circumstances a large drop will burn the skin. Cured adhesive does not present a health hazard even if bonded to the skin.

Eye contact: Irritating to eyes. Causes excessive tearing. Eyelids may bond.

Ingestion: Not expected to be harmful by ingestion. Rapidly polymerizes (solidifies) and bonds in mouth. It is almost impossible to swallow.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Ethyl 2-cyanoacrylate	None	Irritant, Allergen, Respiratory
Thickener	None	Irritant

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Ethyl 2-cyanoacrylate	No	No	No
Thickener	No	No	No

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Combustible liquid, n.o.s. (Cyanoacrylate ester)
Hazard class or division: Combustible Liquid
Identification number: NA 1993
Packing group: III

International Air Transportation (ICAO/IATA)

Proper shipping name: Aviation regulated liquid, n.o.s. (Cyanoacrylate ester)
Hazard class or division: 9
Identification number: UN 3334
Packing group: III
Exceptions: Primary packs containing less than 500ml are unregulated by this mode of transport and may be shipped unrestricted.

Water Transportation (IMO/IMDG)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12 (b) Export Notification: None above reporting de minimis

CERCLA/SARA Section 302 EHS: None above reporting de minimis
CERCLA/SARA Section 311/312: Immediate Health, Delayed Health, Fire, Reactive
CERCLA/SARA Section 313: None above reporting de minimis

California Proposition 65: No California Proposition 65 listed chemicals are known to be present.

Canada Regulatory Information

CEPA DSL/NDSL Status: Contains one or more components listed on the Non-Domestic Substances List. All other components are listed on or are exempt from listing on the Domestic Substances List. Components listed on the NDSL must be tracked by all Canadian Importers of Record as required by Environment Canada. They may be imported into Canada in limited quantities. Please contact Regulatory Affairs for additional details.

16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: New Safety Data Sheet format.

Prepared by: Catherine Bimler, Regulatory Affairs Specialist

Issue date: 08/08/2014

DISCLAIMER: The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation and its affiliates (“Henkel”) does not assume responsibility for any results obtained by persons over whose methods Henkel has no control. It is the user’s responsibility to determine the suitability of Henkel’s products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any Henkel’s products. In light of the foregoing, Henkel specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel’s products. Henkel further disclaims any liability for consequential or incidental damages of any kind, including lost profits.

Revision Number: 005.1 **Issue date:** 12/16/2015

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite(R) 577 Thread Sealant Medium Strength**
IDH number: 231119
Product type: Anaerobic Sealant
Item number: 21456
Restriction of Use: None identified
Region: United States

Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

Contact information:
Telephone: (860) 571-5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW	
WARNING:	CAUSES SKIN IRRITATION. MAY CAUSE AN ALLERGIC SKIN REACTION. CAUSES SERIOUS EYE IRRITATION.

HAZARD CLASS	HAZARD CATEGORY
SKIN IRRITATION	2
EYE IRRITATION	2A
SKIN SENSITIZATION	1

PICTOGRAM(S)

Precautionary Statements

Prevention: Avoid breathing vapors, mist, or spray. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Wear eye and face protection. Wear protective gloves.

Response: IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If skin irritation or rash occurs: Get medical attention. If eye irritation persists: Get medical attention. Take off contaminated clothing.

Storage: Not prescribed

Disposal: Dispose of contents and/or container according to Federal, State/Provincial and local governmental regulations.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Polyglycol dimethacrylate	Proprietary	30 - 60
Polyglycoldioctanoate	Proprietary	10 - 30
Lauryl methacrylate	142-90-5	5 - 10
Ethene, tetrafluoro-, homopolymer	9002-84-0	1 - 5
Vinyl Resin	Proprietary	1 - 5
Silicon dioxide	7631-86-9	1 - 5
Rheological additive	Unknown	1 - 5
Alkyl Methacrylate	Proprietary	1 - 5
Tetradecyl methacrylate	2549-53-3	1 - 5
1-Acetyl-2-phenylhydrazine	114-83-0	0.1 - 1
Cumene hydroperoxide	80-15-9	0.1 - 1

Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Skin contact: Immediately flush skin with plenty of water (using soap, if available). Remove contaminated clothing and footwear. Wash clothing before reuse. Get medical attention.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Ingestion: DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Symptoms: See Section 11.

5. FIRE FIGHTING MEASURES

Extinguishing media: Water spray (fog), foam, dry chemical or carbon dioxide.

Special firefighting procedures: Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear. In case of fire, keep containers cool with water spray.

Unusual fire or explosion hazards: Uncontrolled polymerization may occur at high temperatures resulting in explosions or rupture of storage containers.

Hazardous combustion products: Oxides of carbon. Oxides of nitrogen. Oxides of sulfur. Irritating organic vapours.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Do not allow product to enter sewer or waterways.

Clean-up methods: Remove all sources of ignition. Evacuate and ventilate spill area; dike spill to prevent entry into water system; wear full protective equipment during clean-up. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Scrape up as much material as possible. Store in a partly filled, closed container until disposal. Refer to Section 8 "Exposure Controls / Personal Protection" prior to clean up.

7. HANDLING AND STORAGE

Handling: Use only with adequate ventilation. Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling. Keep container closed. Refer to Section 8.

Storage: For safe storage, store at or below 38 °C (100.4 °F)
Keep in a cool, well ventilated area away from heat, sparks and open flame.
Keep container tightly closed until ready for use.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyglycol dimethacrylate	None	None	None	None
Polyglycoldioctanoate	None	None	None	None
Lauryl methacrylate	None	None	None	50 ppm
Ethene, tetrafluoro-, homopolymer	None	None	None	10 mg/m3 TWA Total dust. 5 mg/m3 TWA Respirable fraction.
Vinyl Resin	None	None	None	None
Silicon dioxide	6 mg/m3 TWA	20 MPPCF TWA 0.8 mg/m3 TWA	None	3 mg/m3 TWA Respirable fraction.
Rheological additive	10 mg/m3 TWA Total dust. 3 mg/m3 TWA Respirable fraction.	15 mg/m3 TWA Total dust. 5 mg/m3 TWA Respirable fraction.	None	None
Alkyl Methacrylate	None	None	None	None
Tetradecyl methacrylate	None	None	None	50 ppm TWA 75 ppm STEL
1-Acetyl-2-phenylhydrazine	None	None	None	None
Cumene hydroperoxide	None	None	1 ppm (6 mg/m3) TWA (SKIN)	None

Engineering controls: Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety goggles or safety glasses with side shields. Full face protection should be used if the potential for splashing or spraying of product exists. Safety showers and eye wash stations should be available.

Skin protection: Use chemical resistant, impermeable clothing including gloves and either an apron or body suit to prevent skin contact. Butyl rubber gloves. Natural rubber gloves. Neoprene gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Paste
Color: Yellow, dark
Odor: Mild
Odor threshold: Not available.
pH: 3.0 - 6.0
Vapor pressure: 5 mm hg (27 °C (80.6 °F))
Boiling point/range: > 149 °C (> 300.2 °F) no method
Melting point/ range: Not available.
Specific gravity: 1.15 - 1.2

Vapor density:	Not available.
Flash point:	> 100 °C (> 212°F) Pensky Martens closed cup
Flammable/Explosive limits - lower:	Not available.
Flammable/Explosive limits - upper:	Not available.
Autoignition temperature:	Not available.
Evaporation rate:	Not available.
Solubility in water:	Not available.
Partition coefficient (n-octanol/water):	Not available.
VOC content:	0.1 %; 0.99 g/l
Viscosity:	Not available.
Decomposition temperature:	Not available.

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions of storage and use.
Hazardous reactions:	None under normal processing. Polymerization may occur at elevated temperature or in the presence of incompatible materials.
Hazardous decomposition products:	Oxides of carbon. Irritating organic vapours. Oxides of nitrogen. Oxides of sulfur.
Incompatible materials:	Strong oxidizing agents (peroxides, chlorine, strong acids).
Reactivity:	Not available.
Conditions to avoid:	Elevated temperatures. Heat, flames, sparks and other sources of ignition. Store away from incompatible materials.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure: Skin, Inhalation, Eyes, Ingestion

Potential Health Effects/Symptoms

Inhalation: Inhalation of vapors or mists of the product may be irritating to the respiratory system.
Skin contact: Causes skin irritation. May cause allergic skin reaction.
Eye contact: Causes serious eye irritation.
Ingestion: May cause gastrointestinal tract irritation if swallowed.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Polyglycol dimethacrylate	None	Allergen, Irritant
Polyglycoldioctanoate	None	Irritant
Lauryl methacrylate	Oral LD50 (RAT) = > 5.0 g/kg	Irritant, Allergen
Ethene, tetrafluoro-, homopolymer	None	No Target Organs
Vinyl Resin	None	Irritant
Silicon dioxide	Oral LD50 (RAT) = > 22,500 mg/kg	Nuisance dust
Rheological additive	None	No Data
Alkyl Methacrylate	None	Irritant, Allergen
Tetradecyl methacrylate	None	Irritant, Allergen
1-Acetyl-2-phenylhydrazine	None	Allergen, Blood, Kidney, Mutagen, Some evidence of carcinogenicity
Cumene hydroperoxide	None	Allergen, Central nervous system, Corrosive, Irritant, Mutagen

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyglycol dimethacrylate	No	No	No
Polyglycoldioctanoate	No	No	No
Lauryl methacrylate	No	No	No
Ethene, tetrafluoro-, homopolymer	No	No	No
Vinyl Resin	No	No	No
Silicon dioxide	No	No	No
Rheological additive	No	No	No
Alkyl Methacrylate	No	No	No
Tetradecyl methacrylate	No	No	No
1-Acetyl-2-phenylhydrazine	No	No	No
Cumene hydroperoxide	No	No	No

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)
Proper shipping name: RQ, Environmentally hazardous substance, liquid, n.o.s.
Hazard class or division: 9
Identification number: UN 3082
Packing group: III
DOT Hazardous Substance(s): alpha,alpha-Dimethylbenzylhydroperoxide

International Air Transportation (ICAO/IATA)

Proper shipping name:	Environmentally hazardous substance, liquid, n.o.s.
Hazard class or division:	9
Identification number:	UN 3082
Packing group:	III

Water Transportation (IMO/IMDG)

Proper shipping name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Hazard class or division:	9
Identification number:	UN 3082
Packing group:	III

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12 (b) Export Notification:	Ethene, tetrafluoro-, homopolymer (CAS 9002-84-0).
CERCLA/SARA Section 302 EHS:	None above reporting de minimis.
CERCLA/SARA Section 311/312:	Immediate Health, Delayed Health
CERCLA/SARA Section 313:	None above reporting de minimis.
CERCLA Reportable quantity:	Cumene hydroperoxide (CAS 80-15-9) 10 lbs. (4.54 kg)
California Proposition 65:	This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.

16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: New Safety Data Sheet format.

Prepared by: Sheila Gines, Regulatory Affairs Specialist

Issue date: 12/16/2015

DISCLAIMER: The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation and its affiliates ("Henkel") does not assume responsibility for any results obtained by persons over whose methods Henkel has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any Henkel's products. In light of the foregoing, Henkel specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel's products. Henkel further disclaims any liability for consequential or incidental damages of any kind, including lost profits.

Revision Number: 005.1 **Issue date:** 07/15/2015

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite(R) 638 Retaining Compound Slip Fit**
IDH number: 231111
Product type: Anaerobic Adhesive
Item number: 21448
Restriction of Use: None identified
Region: United States

Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

Contact information:
Telephone: (860) 571-5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW	
DANGER:	CAUSES SEVERE SKIN BURNS AND EYE DAMAGE. MAY CAUSE AN ALLERGIC SKIN REACTION.

HAZARD CLASS	HAZARD CATEGORY
SKIN CORROSION	1B
SERIOUS EYE DAMAGE	1
SKIN SENSITIZATION	1

PICTOGRAM(S)

Precautionary Statements

Prevention: Do not breathe vapors, mist, or spray. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves, eye protection, and face protection.

Response: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison control center or physician. If skin irritation or rash occurs: Get medical attention. Wash contaminated clothing before reuse.

Storage: Store locked up.

Disposal: Dispose of contents and/or container according to Federal, State/Provincial and local governmental regulations.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Polyurethane methacrylate resin	Unknown	10 - 30
Hydroxyalkyl methacrylate	27813-02-1	10 - 30
Polyurethane methacrylate resin	Unknown	10 - 30
Acrylic acid	79-10-7	5 - 10
Polyglycol dimethacrylate	Proprietary	1 - 5
Cumene hydroperoxide	80-15-9	1 - 5
Methacrylic acid	79-41-4	1 - 5
1-Acetyl-2-phenylhydrazine	114-83-0	0.1 - 1
Polyglycol dimethacrylate	Proprietary	0.1 - 1
Subsituted Silane	Proprietary	0.1 - 1
2-Hydroxyethyl methacrylate	868-77-9	0.1 - 1
Cumene	98-82-8	0.1 - 1

Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Skin contact: Immediately flush skin with plenty of water (using soap, if available). Remove contaminated clothing and footwear. Wash clothing before reuse. Get medical attention.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Ingestion: DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Symptoms: See Section 11.

5. FIRE FIGHTING MEASURES

Extinguishing media: Water spray (fog), foam, dry chemical or carbon dioxide.

Special firefighting procedures: Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear. In case of fire, keep containers cool with water spray.

Unusual fire or explosion hazards: Uncontrolled polymerization may occur at high temperatures resulting in explosions or rupture of storage containers.

Hazardous combustion products: Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Do not allow product to enter sewer or waterways.

Clean-up methods: Remove all sources of ignition. Evacuate and ventilate spill area; dike spill to prevent entry into water system; wear full protective equipment during clean-up. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Scrape up as much material as possible. Store in a partly filled, closed container until disposal. Refer to Section 8 "Exposure Controls / Personal Protection" prior to clean up.

7. HANDLING AND STORAGE

Handling: Use only with adequate ventilation. Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling. Keep container closed. Refer to Section 8.

Storage: For safe storage, store between 0 °C (32°F) and 32 °C (89.6 °F)
Keep in a cool, well ventilated area away from heat, sparks and open flame.
Keep container tightly closed until ready for use.

For information on product shelf life contact Henkel Customer Service at (800) 243-4874.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyurethane methacrylate resin	None	None	None	None
Hydroxyalkyl methacrylate	None	None	None	1 ppm TWA 3 ppm STEL
Polyurethane methacrylate resin	None	None	None	None
Acrylic acid	2 ppm TWA (SKIN)	None	None	1 ppm TWA 3 ppm STEL (SKIN)
Polyglycol dimethacrylate	None	None	None	None
Cumene hydroperoxide	None	None	1 ppm (6 mg/m3) TWA (SKIN)	None
Methacrylic acid	20 ppm TWA	None	None	None
1-Acetyl-2-phenylhydrazine	None	None	None	None
Polyglycol dimethacrylate	None	None	None	None
Subsituted Silane	None	None	None	None
2-Hydroxyethyl methacrylate	None	None	None	3 ppm Ceiling
Cumene	50 ppm TWA	50 ppm (245 mg/m3) PEL (SKIN)	None	None

Engineering controls: Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety goggles or safety glasses with side shields. Full face protection should be used if the potential for splashing or spraying of product exists. Safety showers and eye wash stations should be available.

Skin protection: Use chemical resistant, impermeable clothing including gloves and either an apron or body suit to prevent skin contact. Neoprene gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Green
Odor:	Sharp
Odor threshold:	Not available.
pH:	Not applicable
Vapor pressure:	10 mm hg (27 °C (80.6 °F))
Boiling point/range:	> 149 °C (> 300.2 °F)
Melting point/ range:	Not available.
Specific gravity:	1.1
Vapor density:	Not available.
Flash point:	> 93.3 °C (> 199.94 °F) Tagliabue closed cup
Flammable/Explosive limits - lower:	Not available.
Flammable/Explosive limits - upper:	Not available.
Autoignition temperature:	Not available.
Evaporation rate:	Not available.
Solubility in water:	Slight
Partition coefficient (n-octanol/water):	Not available.
VOC content:	1.81 %; 19.00 g/l
Viscosity:	Not available.
Decomposition temperature:	Not available.

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions of storage and use.
Hazardous reactions:	None under normal processing. Polymerization may occur at elevated temperature or in the presence of incompatible materials.
Hazardous decomposition products:	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.
Incompatible materials:	Strong oxidizing agents.
Reactivity:	Not available.
Conditions to avoid:	Elevated temperatures. Heat, flames, sparks and other sources of ignition. Store away from incompatible materials.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure: Skin, Inhalation, Eyes, Ingestion

Potential Health Effects/Symptoms

Inhalation: Inhalation of vapors or mists of the product may be irritating to the respiratory system. May cause nose, throat and lung irritation.
Skin contact: Corrosive to skin. Causes skin burns. May cause allergic skin reaction.
Eye contact: Causes serious eye damage.
Ingestion: May cause gastrointestinal tract irritation if swallowed.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Polyurethane methacrylate resin	None	Irritant, Allergen
Hydroxyalkyl methacrylate	None	Irritant, Allergen
Polyurethane methacrylate resin	None	Irritant, Allergen
Acrylic acid	Oral LD50 (RAT) = 33.5 mg/kg Oral LD50 (RAT) = 2.5 g/kg Oral LD50 (RAT) = 193 mg/kg Oral LD50 (RAT) = 1,250 mg/kg Inhalation LC50 (RAT, 4 h) = 1,200 mg/l	Allergen, Corrosive, Irritant, Kidney, Liver
Polyglycol dimethacrylate	None	Irritant, Allergen
Cumene hydroperoxide	None	Allergen, Central nervous system, Corrosive, Irritant, Mutagen
Methacrylic acid	Oral LD50 (RABBIT) = 1,200 mg/kg Oral LD50 (RAT) = 1,060 mg/kg Oral LD50 (RAT) = 2,224 mg/kg Dermal LD50 (RABBIT) = 500 mg/kg Inhalation LC50 (RAT, 4 h) = 7.1 mg/l	Corrosive, Irritant, Allergen
1-Acetyl-2-phenylhydrazine	None	Allergen, Blood, Kidney, Mutagen, Some evidence of carcinogenicity
Polyglycol dimethacrylate	None	Allergen, Irritant
Subsituted Silane	None	Irritant, Allergen
2-Hydroxyethyl methacrylate	Oral LD50 (RAT) = 11.2 g/kg Oral LD50 (RAT) = 5,050 mg/kg	Irritant, Allergen
Cumene	Oral LD50 (RAT) = 2.91 g/kg Oral LD50 (RAT) = 1,400 mg/kg Inhalation LC50 (RAT, 4 h) = 8000 ppm	Central nervous system, Irritant, Lung

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyurethane methacrylate resin	No	No	No
Hydroxyalkyl methacrylate	No	No	No
Polyurethane methacrylate resin	No	No	No
Acrylic acid	No	No	No
Polyglycol dimethacrylate	No	No	No
Cumene hydroperoxide	No	No	No
Methacrylic acid	No	No	No
1-Acetyl-2-phenylhydrazine	No	No	No
Polyglycol dimethacrylate	No	No	No
Subsituted Silane	No	No	No
2-Hydroxyethyl methacrylate	No	No	No
Cumene	Reasonably Anticipated to be a Human Carcinogen.	Group 2B	No

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

TSCA 12 (b) Export Notification: None above reporting de minimis

CERCLA/SARA Section 302 EHS: None above reporting de minimis

CERCLA/SARA Section 311/312: Immediate Health, Delayed Health

CERCLA/SARA Section 313: This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Acrylic acid (CAS 79-10-7). Cumene hydroperoxide (CAS 80-15-9).

CERCLA Reportable quantity: Cumene hydroperoxide (CAS 80-15-9) 10 lbs. (4.54 kg)

California Proposition 65: This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information

CEPA DSL/NDSL Status: All components are listed on or are exempt from listing on the Canadian Domestic Substances List.

16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: New Safety Data Sheet format. 11

Prepared by: Sheila Gines, Regulatory Affairs Specialist

Issue date: 07/15/2015

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Revision Number: 004.1

Issue date: 07/08/2015

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: **Loctite 641**
Product type: Adhesive
Restriction of Use: None identified
Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067

IDH number: 233544
Item number: 28801
Region: United States
Contact information:
Telephone: (860) 571-5100
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW	
WARNING:	CAUSES SKIN IRRITATION. MAY CAUSE AN ALLERGIC SKIN REACTION. CAUSES SERIOUS EYE IRRITATION.

HAZARD CLASS	HAZARD CATEGORY
SKIN IRRITATION	2
EYE IRRITATION	2A
SKIN SENSITIZATION	1

PICTOGRAM(S)

Precautionary Statements

Prevention: Avoid breathing vapors, mist, or spray. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Wear eye and face protection. Wear protective gloves.

Response: IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If skin irritation or rash occurs: Get medical attention. If eye irritation persists: Get medical attention. Take off contaminated clothing.

Storage: Not prescribed

Disposal: Dispose of contents and/or container according to Federal, State/Provincial and local governmental regulations.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*

Polyglycol dimethacrylate	Proprietary	60 - 100
Polyglycoldioctanoate	Proprietary	10 - 30
Cumene hydroperoxide	80-15-9	1 - 5
Saccharin	81-07-2	1 - 5
Cumene	98-82-8	0.1 - 1

Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Skin contact: Immediately flush skin with plenty of water (using soap, if available). Remove contaminated clothing and footwear. Wash clothing before reuse. Get medical attention.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Ingestion: DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Symptoms: See Section 11.

5. FIRE FIGHTING MEASURES

Extinguishing media: Water spray (fog), foam, dry chemical or carbon dioxide.

Special firefighting procedures: Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear. In case of fire, keep containers cool with water spray.

Unusual fire or explosion hazards: Uncontrolled polymerization may occur at high temperatures resulting in explosions or rupture of storage containers.

Hazardous combustion products: Oxides of carbon. Irritating organic vapours.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions: Do not allow product to enter sewer or waterways.

Clean-up methods: Remove all sources of ignition. Evacuate and ventilate spill area; dike spill to prevent entry into water system; wear full protective equipment during clean-up. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Scrape up as much material as possible. Store in a partly filled, closed container until disposal. Refer to Section 8 "Exposure Controls / Personal Protection" prior to clean up.

7. HANDLING AND STORAGE

Handling: Use only with adequate ventilation. Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling. Keep container closed. Refer to Section 8.

Storage: For safe storage, store at or below 38 °C (100.4 °F)
Keep in a cool, well ventilated area away from heat, sparks and open flame.
Keep container tightly closed until ready for use.

For information on product shelf life contact Henkel Customer Service at (800) 243-4874.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyglycol dimethacrylate	None	None	None	None
Polyglycoldioctanoate	None	None	None	None
Cumene hydroperoxide	None	None	1 ppm (6 mg/m3) TWA (SKIN)	None
Saccharin	None	None	None	None
Cumene	50 ppm TWA	50 ppm (245 mg/m3) PEL (SKIN)	None	None

Engineering controls: Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety goggles or safety glasses with side shields. Full face protection should be used if the potential for splashing or spraying of product exists. Safety showers and eye wash stations should be available.

Skin protection: Use chemical resistant, impermeable clothing including gloves and either an apron or body suit to prevent skin contact. Neoprene gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid
Color: yellow
Odor: characteristic
Odor threshold: Not available.
pH: Not available.
Vapor pressure: 5 mm hg (27 °C (80.6 °F))
Boiling point/range: > 149 °C (> 300.2 °F)
Melting point/ range: Not available.
Specific gravity: 1.08 at 20 °C (68°F)
Vapor density: Not available.
Flash point: > 93.3 °C (> 199.94 °F) Tagliabue closed cup
Flammable/Explosive limits - lower: Not available.
Flammable/Explosive limits - upper: Not available.
Autoignition temperature: Not available.
Evaporation rate: Not available.
Solubility in water: Slight
Partition coefficient (n-octanol/water): Not available.
VOC content: 0.07 %; 0.75 g/l
Viscosity: Not available.
Decomposition temperature: Not available.

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of storage and use.

Hazardous reactions: None under normal processing. Polymerization may occur at elevated temperature or in the presence of incompatible materials.

Hazardous decomposition products: Oxides of carbon. Irritating organic vapours.

Incompatible materials: Free radical initiators. Oxidizing agents. Reducing agents. Metal oxides. Acids. Alkalis.

Reactivity: Not available.

Conditions to avoid: Elevated temperatures. Heat, flames, sparks and other sources of ignition. Store away from incompatible materials.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure: Skin, Inhalation, Eyes, Ingestion

Potential Health Effects/Symptoms

Inhalation: Inhalation of vapors or mists of the product may be irritating to the respiratory system. May cause irritation to nose and throat.
Skin contact: Causes skin irritation. May cause allergic skin reaction.
Eye contact: Causes serious eye irritation.
Ingestion: May cause irritation to the gastrointestinal tract, mouth and mucous membranes.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Polyglycol dimethacrylate	None	Allergen, Irritant
Polyglycoldioctanoate	None	Irritant
Cumene hydroperoxide	None	Allergen, Central nervous system, Corrosive, Irritant, Mutagen
Saccharin	None	No Target Organs
Cumene	Oral LD50 (RAT) = 2.91 g/kg Oral LD50 (RAT) = 1,400 mg/kg Inhalation LC50 (RAT, 4 h) = 8000 ppm	Central nervous system, Irritant, Lung

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyglycol dimethacrylate	No	No	No
Polyglycoldioctanoate	No	No	No
Cumene hydroperoxide	No	No	No
Saccharin	No	No	No
Cumene	Reasonably Anticipated to be a Human Carcinogen.	Group 2B	No

12. ECOLOGICAL INFORMATION

Ecological information: Not available.

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

Water Transportation (IMO/IMDG)

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12 (b) Export Notification: None above reporting de minimis

CERCLA/SARA Section 302 EHS: None above reporting de minimis
CERCLA/SARA Section 311/312: Immediate Health, Delayed Health
CERCLA/SARA Section 313: This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Cumene hydroperoxide (CAS 80-15-9). Saccharin (CAS 81-07-2).
CERCLA Reportable quantity: Cumene hydroperoxide (CAS 80-15-9) 10 lbs. (4.54 kg)

California Proposition 65: This product contains a chemical known in the State of California to cause cancer.

Canada Regulatory Information

CEPA DSL/NDSL Status: All components are listed on or are exempt from listing on the Canadian Domestic Substances List.

16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: New Safety Data Sheet format. 11

Prepared by: Sheila Gines, Regulatory Affairs Specialist

Issue date: 07/08/2015

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Safety Data Sheet according to Regulation (EC) No1907/2006

SDS No. : 179512
V005.9

Loctite 7063

Revision: 27.06.2014
printing date: 13.07.2014

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Loctite 7063

Contains:
Naphtha, hydrotreated light, <0,1% benzene

1.2. Relevant identified uses of the substance or mixture and uses advised against
Intended use:
Solvent based cleaner

1.3. Details of the supplier of the safety data sheet
Henkel Limited
2 Bishop Square Business Park
AL109EY Herfordshire Hatfield

Great Britain

Phone: +44 1606 593933
Fax-no.: +44 1606 863762

ua-productsafety.uk@uk.henkel.com

1.4. Emergency telephone number
24 Hours Emergency Tel: +44 (0)1442 278497

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (CLP):

Flammable aerosols	Category 1
H222 Extremely flammable aerosol.	
H229 Pressurised container: May burst if heated.	
Skin irritation	Category 2
H315 Causes skin irritation.	
Specific target organ toxicity - single exposure	Category 3
H336 May cause drowsiness or dizziness.	
Target organ: Central Nervous System	
Chronic hazards to the aquatic environment	Category 2
H411 Toxic to aquatic life with long lasting effects.	

Classification (DPD):

F+ - Extremely flammable
R12 Extremely flammable.
Xi - Irritant
R38 Irritating to skin.
N - Dangerous for the environment
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R67 Vapours may cause drowsiness and dizziness.

2.2. Label elements

Label elements (CLP):

Hazard pictogram:	
Signal word:	Danger
Hazard statement:	H222 Extremely flammable aerosol. H229 Pressurised container: May burst if heated. H315 Causes skin irritation. H336 May cause drowsiness or dizziness. H411 Toxic to aquatic life with long lasting effects.
Precautionary statement:	P251 Do not pierce or burn, even after use. P410+P412 Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. P211 Do not spray on an open flame or other ignition source. P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P102 Keep out of reach of children. ***For consumer use only: P101 If medical advice is needed, have product container or label at hand. P102 Keep out of reach of children. P501 Dispose of waste and residues in accordance with local authority requirements***
Precautionary statement: Prevention	P261 Avoid breathing spray. P273 Avoid release to the environment.
Precautionary statement: Response	P302+P352 IF ON SKIN: Wash with plenty of soap and water.

Label elements (DPD):

F+ - Extremely flammable

Xi - Irritant

N - Dangerous for the environment

Risk phrases:

R12 Extremely flammable.
R38 Irritating to skin.
R67 Vapours may cause drowsiness and dizziness.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases:

S16 Keep away from sources of ignition - No smoking.
S23 Do not breathe vapour.
S24 Avoid contact with skin.
S51 Use only in well-ventilated areas.
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

Additional labeling:

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material. Keep away from sources of ignition - No smoking. Keep out of the reach of children
For consumer use only: S2 Keep out of the reach of children.
S46 If swallowed, seek medical advice immediately and show this container or label.

2.3. Other hazards

The aerosol container is under pressure. Do not expose to high temperatures.

SECTION 3: Composition/information on ingredients

General chemical description:

Solvent cleaner

Declaration of the ingredients according to CLP (EC) No 1272/2008:

Hazardous components CAS-No.	EC Number REACH-Reg No.	content	Classification
Naphtha, hydrotreated light, <0,1% benzene 64742-49-0	265-151-9 01-2119475514-35 01-2119484651-34	> 50- < 70 %	Flammable liquids 2 H225 Aspiration hazard 1 H304 Skin irritation 2 H315 Specific target organ toxicity - single exposure 3 H336 Chronic hazards to the aquatic environment 2 H411
Ethanol 64-17-5	200-578-6 01-2119457610-43	> 10- < 20 %	Serious eye irritation 2 H319 Flammable liquids 2 H225
Methylal 109-87-5	203-714-2	> 10- < 20 %	Flammable liquids 2 H225
Carbon dioxide 124-38-9	204-696-9	2,5- < 10 %	

For full text of the H - statements and other abbreviations see section 16 "Other information".
Substances without classification may have community workplace exposure limits available.

Declaration of ingredients according to DPD (EC) No 1999/45:

Hazardous components CAS-No.	EC Number REACH-Reg No.	content	Classification
Naphtha, hydrotreated light, <0,1% benzene 64742-49-0	265-151-9 01-2119475514-35 01-2119484651-34	> 50 - < 70 %	F - Highly flammable; R11 Xn - Harmful; R65 Xi - Irritant; R38 R67 N - Dangerous for the environment; R51/53
Ethanol 64-17-5	200-578-6 01-2119457610-43	> 10 - < 20 %	F - Highly flammable; R11
Methylal 109-87-5	203-714-2	> 10 - < 20 %	F - Highly flammable; R11
Carbon dioxide 124-38-9	204-696-9	2,5 - < 10 %	

For full text of the R-Phrases indicated by codes see section 16 'Other Information'.
Substances without classification may have community workplace exposure limits available.
Declaration of ingredients according to Detergent Regulation 648/2004/EC

> 30 % aliphatic hydrocarbons

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Move to fresh air. If symptoms persist, seek medical advice.

Skin contact:
Rinse with running water and soap.
Obtain medical attention if irritation persists.

Eye contact:
Rinse immediately with plenty of running water (for 10 minutes), seek medical attention from a specialist.

Ingestion:
Rinse mouth, drink 1-2 glasses of water, do not induce vomiting, consult a doctor.

4.2. Most important symptoms and effects, both acute and delayed
Vapors may cause drowsiness and dizziness.

SKIN: Redness, inflammation.

Prolonged or repeated contact may cause eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed
See section: Description of first aid measures

SECTION 5: Firefighting measures

Combustion behaviour:
Solvent containing flammable product. In case of fire toxic gases are released.

5.1. Extinguishing media
Suitable extinguishing media:
Foam, extinguishing powder, carbon dioxide.

Extinguishing media which must not be used for safety reasons:
None known

5.2. Special hazards arising from the substance or mixture
Vapours may accumulate in low or confined areas, travel considerable distance to source of ignition, and flash back.
Oxides of carbon, oxides of nitrogen, irritating organic vapors.

5.3. Advice for firefighters
Wear self-contained breathing apparatus.

Additional information:
In case of fire, keep containers cool with water spray.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Remove sources of ignition.
Ensure adequate ventilation.

6.2. Environmental precautions
Do not let product enter drains.

6.3. Methods and material for containment and cleaning up
Wipe up using absorbent material.
Store in a partly filled, closed container until disposal.
Dispose of contaminated material as waste according to Section 13.

6.4. Reference to other sections
See advice in section 8

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Keep away from sources of ignition - no smoking.
Vapours should be extracted to avoid inhalation.
Use only in well-ventilated areas.

Hygiene measures:
Wash hands before work breaks and after finishing work.
Do not eat, drink or smoke while working.
Good industrial hygiene practices should be observed.

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, dry place.
Do not store near sources of heat or ignition, or reactive materials.
Store between 0°C and 32°C. (32°F and 90°F)

7.3. Specific end use(s)

Solvent based cleaner

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits

Valid for
Great Britain

Ingredient	ppm	mg/m³	Type	Category	Remarks
ETHANOL 64-17-5	1.000	1.920	Time Weighted Average (TWA):		EH40 WEL
DIMETHOXYMETHANE 109-87-5	1.250	3.950	Short Term Exposure Limit (STEL):		EH40 WEL
DIMETHOXYMETHANE 109-87-5	1.000	3.160	Time Weighted Average (TWA):		EH40 WEL
Carbon dioxide 124-38-9					
CARBON DIOXIDE 124-38-9	15.000	27.400	Short Term Exposure Limit (STEL):		EH40 WEL
CARBON DIOXIDE 124-38-9	5.000	9.150	Time Weighted Average (TWA):		EH40 WEL
CARBON DIOXIDE 124-38-9	5.000	9.000	Time Weighted Average (TWA):	Indicative	ECTLV

Predicted No-Effect Concentration (PNEC):

Name on list	Environmental Compartment	Exposure period	Value				Remarks
			mg/l	ppm	mg/kg	others	
Ethanol 64-17-5	aqua (freshwater)					0,96 mg/L	
Ethanol 64-17-5	aqua (marine water)					0,79 mg/L	
Ethanol 64-17-5	aqua (intermittent releases)					2,75 mg/L	
Ethanol 64-17-5	sediment (freshwater)				3,6 mg/kg		
Ethanol 64-17-5	soil				0,63 mg/kg		
Ethanol 64-17-5	STP					580 mg/L	
Ethanol 64-17-5	oral				720 mg/kg		
Ethanol 64-17-5	sediment (marine water)				2,9 mg/kg		

Derived No-Effect Level (DNEL):

Name on list	Application Area	Route of Exposure	Health Effect	Exposure Time	Value	Remarks
Naphtha (petroleum), hydrotreated light 64742-49-0	worker	Dermal	Long term exposure - systemic effects		13964 mg/kg bw/day	
Naphtha (petroleum), hydrotreated light 64742-49-0	general population	oral	Long term exposure - systemic effects		1301 mg/kg bw/day	
Naphtha (petroleum), hydrotreated light 64742-49-0	general population	Dermal	Long term exposure - systemic effects		1377 mg/kg bw/day	
Naphtha (petroleum), hydrotreated light 64742-49-0	general population	inhalation	Long term exposure - systemic effects		1131 mg/m3	
Naphtha (petroleum), hydrotreated light 64742-49-0	worker	inhalation	Long term exposure - systemic effects		5306 mg/m3	
Ethanol 64-17-5	worker	inhalation	Acute/short term exposure - local effects		1900 mg/m3	
Ethanol 64-17-5	worker	Dermal	Long term exposure - systemic effects		343 mg/kg bw/day	
Ethanol 64-17-5	worker	inhalation	Long term exposure - systemic effects		950 mg/m3	
Ethanol 64-17-5	general population	inhalation	Acute/short term exposure - local effects		950 mg/m3	
Ethanol 64-17-5	general population	Dermal	Long term exposure - systemic effects		206 mg/kg bw/day	
Ethanol 64-17-5	general population	inhalation	Long term exposure - systemic effects		114 mg/m3	
Ethanol 64-17-5	general population	oral	Long term exposure - systemic effects		87 mg/kg bw/day	

Biological Exposure Indices:
None

8.2. Exposure controls:

Engineering controls:
Ensure good ventilation/extraction.

Respiratory protection:
Use only in well-ventilated areas.
An approved mask or respirator fitted with an organic vapour cartridge should be worn if the product is used in a poorly ventilated area
Filter type: A

Hand protection:
Chemical-resistant protective gloves (EN 374).
Suitable materials for short-term contact or splashes (recommended: at least protection index 2, corresponding to > 30 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced.

Eye protection:
Safety glasses with sideshields or chemical safety goggles should be worn if there is a risk of splashing.

Skin protection:
Wear suitable protective clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Aerosol colourless
Odor	hydrocarbons
Odour threshold	No data available / Not applicable
pH	Not applicable
Initial boiling point	-78 °C (-108.4 °F)
Flash point	-18 °C (0.4 °F)
Decomposition temperature	No data available / Not applicable
Vapour pressure (20 °C (68 °F))	440 hPa
Density (20 °C (68 °F))	0,742 g/cm3
Bulk density	No data available / Not applicable
Viscosity	No data available / Not applicable
Viscosity (kinematic)	No data available / Not applicable
Explosive properties	No data available / Not applicable
Solubility (qualitative) (Solvent: Water)	Not miscible
Solubility (qualitative) (Solvent: Acetone)	Miscible
Solidification temperature	No data available / Not applicable
Melting point	No data available / Not applicable
Flammability	No data available / Not applicable
Auto-ignition temperature	No data available / Not applicable
Explosive limits	
lower	0,8 %(V)
upper	15 %(V)
Partition coefficient: n-octanol/water	No data available / Not applicable
Evaporation rate	No data available / Not applicable
Vapor density	No data available / Not applicable
Oxidising properties	No data available / Not applicable

9.2. Other information

Ignition temperature	200 °C (392 °F)

SECTION 10: Stability and reactivity

10.1. Reactivity
Strong oxidizing agents.

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
See section reactivity

10.4. Conditions to avoid
Stable under normal conditions of storage and use.
Heat, flames, sparks and other sources of ignition.

10.5. Incompatible materials
None if used properly.

10.6. Hazardous decomposition products
None if used for intended purpose.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

General toxicological information:
The mixture is classified based on the available hazard information for the ingredients as defined in the classification criteria for mixtures for each hazard class or differentiation in Annex I to Regulation 1272/2008/EC. Relevant available health/ecological information for the substances listed under Section 3 is provided in the following.

STOT-single exposure:
May cause drowsiness or dizziness.

Oral toxicity:
May cause irritation to the digestive tract.

Skin irritation:
Solvent may remove essential oils from the skin making it susceptible to attack from other chemicals.
Causes skin irritation.

Eye irritation:
May cause mild irritation to the eyes.

Acute oral toxicity:

Hazardous components CAS-No.	Value type	Value	Route of application	Exposure time	Species	Method
Ethanol 64-17-5	LD50	13.700 mg/kg	oral		rat	

Acute inhalative toxicity:

Hazardous components CAS-No.	Value type	Value	Route of application	Exposure time	Species	Method
Ethanol 64-17-5	LC50	124,7 mg/l	inhalation	4 h	rat	

Acute dermal toxicity:

Hazardous components CAS-No.	Value type	Value	Route of application	Exposure time	Species	Method
Ethanol 64-17-5	LDLo	20.000 mg/kg	dermal		rabbit	

Skin corrosion/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Ethanol 64-17-5	not irritating		rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

Serious eye damage/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Ethanol 64-17-5	Category II		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)

Respiratory or skin sensitization:

Hazardous components CAS-No.	Result	Test type	Species	Method
Ethanol 64-17-5	not sensitising	Guinea pig maximisation test	guinea pig	Magnusson and Kligman Method

Germ cell mutagenicity:

Hazardous components CAS-No.	Result	Type of study / Route of administration	Metabolic activation / Exposure time	Species	Method
Ethanol 64-17-5	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
	negative	in vitro mammalian chromosome aberration test	without		

SECTION 12: Ecological information

General ecological information:

The mixture is classified based on the available hazard information for the ingredients as defined in the classification criteria for mixtures for each hazard class or differentiation in Annex I to Regulation 1272/2008/EC. Relevant available health/ecological information for the substances listed under Section 3 is provided in the following.

12.1. Toxicity

Ecotoxicity:

Do not empty into drains / surface water / ground water.
Toxic to aquatic life with long lasting effects.

Hazardous components CAS-No.	Value type	Value	Acute Toxicity Study	Exposure time	Species	Method
Ethanol 64-17-5	LC50	14,2 g/l	Fish	96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)
Ethanol 64-17-5	EC50	9.268 - 14.221 mg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Ethanol 64-17-5	EC50	> 5.000 mg/l	Algae	7 d	Scenedesmus quadricauda	OECD Guideline 201 (Alga, Growth Inhibition Test)
Ethanol 64-17-5	NOEC	2 mg/l	chronic Daphnia	10 d		
Methylal 109-87-5	LC50	6.990 mg/l	Fish	96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)
Methylal 109-87-5	EC50	> 500 mg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Methylal 109-87-5	EC10	> 500 mg/l	Algae	96 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	OECD Guideline 201 (Alga, Growth Inhibition Test)

12.2. Persistence and degradability

Persistence and Biodegradability:

No data available.

Persistence and degradability:

Degradation of surfactants

The product does not contain surface-active substances as defined in the EU Detergent Regulation (EC/648/2004).

Hazardous components CAS-No.	Result	Route of application	Degradability	Method
Ethanol 64-17-5	readily biodegradable	aerobic	80 - 85 %	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Methylal 109-87-5			88 %	OECD 301 A - F

12.3. Bioaccumulative potential / 12.4. Mobility in soil

Mobility:
The product evaporates readily.

Bioaccumulative potential:
No data available.

Hazardous components CAS-No.	LogKow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method
Ethanol 64-17-5	-0,31					

12.5. Results of PBT and vPvB assessment

Hazardous components CAS-No.	PBT/vPvB
Naphtha, hydrotreated light, <0,1% benzene 64742-49-0	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.
Ethanol 64-17-5	Not fulfilling Persistent, Bioaccumulative and Toxic (PBT), very Persistent and very Bioaccumulative (vPvB) criteria.

12.6. Other adverse effects

No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product disposal:
Dispose of according to regulations.

Disposal of uncleaned packages:
After use, tubes, cartons and bottles containing residual product should be disposed of as chemically contaminated waste in an authorised legal land fill site or incinerated.
Disposal must be made according to official regulations.

Waste code
14 06 03 Other solvents and solvent mixtures

SECTION 14: Transport information

14.1. UN number

ADR	1950
RID	1950
ADNR	1950
IMDG	1950
IATA	1950

14.2. UN proper shipping name

ADR	AEROSOLS
RID	AEROSOLS
ADNR	AEROSOLS
IMDG	AEROSOLS (Solvent Naphtha (Petroleum), Light Aromatic)
IATA	Aerosols, flammable

14.3. Transport hazard class(es)

ADR	2.1
RID	2.1
ADNR	2.1
IMDG	2.1
IATA	2.1

14.4. Packaging group

ADR	
RID	
ADNR	
IMDG	
IATA	

14.5. Environmental hazards

ADR	Environmentally Hazardous
RID	Environmentally Hazardous
ADNR	Environmentally Hazardous
IMDG	Environmentally Hazardous
IATA	not applicable

14.6. Special precautions for user

ADR	not applicable Tunnelcode: (D)
RID	not applicable
ADNR	not applicable
IMDG	not applicable
IATA	not applicable

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

VOC content (1999/13/EC) 95 %

15.2. Chemical safety assessment

A chemical safety assessment has not been carried out.

SECTION 16: Other information

The labelling of the product is indicated in Section 2. The full text
of all abbreviations indicated by codes in this safety data sheet are as follows:

R11 Highly flammable.
R38 Irritating to skin.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65 Harmful: may cause lung damage if swallowed.
R67 Vapours may cause drowsiness and dizziness.
H225 Highly flammable liquid and vapor.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H411 Toxic to aquatic life with long lasting effects.

Further information:

This information is based on our current level of knowledge and relates to the product in the state in which it is delivered. It is intended to describe our products from the point of view of safety requirements and is not intended to guarantee any particular properties.

Safety Data Sheet according to (EC) No 1907/2006

sds no. : 173274
V003.1

7240 90 ML E/G/A 34882

Revision: 29.07.2011
printing date: 03.05.2012

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier:
7240 90 ML E/G/A 34882

Relevant identified uses of the substance or mixture and uses advised against:
Intended use:
activator

Details of the supplier of the safety data sheet:
Henkel Limited
2 Bishop Square Business Park
AL109EY Herfordshire Hatfield

Great Britain

Phone: +44 1606 593933
Fax-no.: +44 1606 863762

ua-productsafety.uk@uk.henkel.com

Emergency Telephone Number:
24 Hours Emergency Tel: +44 (0)1442 278497

SECTION 2: Hazards identification

Classification of the substance or mixture:

Classification (DPD):
Sensitizing
R43 May cause sensitisation by skin contact.
Dangerous for the environment
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Label elements (DPD):

Xi - Irritant

Risk phrases:
R43 May cause sensitisation by skin contact.
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases:
S24 Avoid contact with skin.
S37 Wear suitable gloves.
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

Contains:
Hydroxypropyl methacrylate

Other hazards:
None if used properly.

SECTION 3: Composition/information on ingredients

General chemical description:
Activator

Declaration of the ingredients according to CLP (EC) No 1272/2008:

Hazardous components CAS-No.	EC Number REACH-Reg No.	content	Classification
Limonene, D- 5989-27-5	227-813-5	0,1- 1 %	Flammable liquids 3 H226 Acute hazards to the aquatic environment 1 H400 Skin irritation 2 H315 Skin sensitizer 1 H317 Chronic hazards to the aquatic environment 1 H410
Copper naphthenate 1338-02-9	215-657-0	0,1- 1 %	Chronic hazards to the aquatic environment 1 H410 Acute hazards to the aquatic environment 1 H400 Flammable liquids 3 H226 Acute toxicity 4; Oral H302

Only dangerous ingredients for which a CLP classification is already available are displayed in this table.
For full text of the H - statements and other abbreviations see section 16 "Other information".
Substances without classification may have community workplace exposure limits available.

Declaration of ingredients according to DPD (EC) No 1999/45:

Hazardous components CAS-No.	EC Number REACH-Reg No.	content	Classification
Hydroxypropyl methacrylate 27813-02-1	248-666-3	1 - 5 %	Xi - Irritant; R36, R43
Limonene, D- 5989-27-5	227-813-5	0,1 - 1 %	N - Dangerous for the environment; R50, R53 R10 Xi - Irritant; R38 R43
Copper naphthenate 1338-02-9	215-657-0	0,1 - 1 %	R10 Xn - Harmful; R22 N - Dangerous for the environment; R50, R53

For full text of the R-Phrases indicated by codes see section 16 'Other Information'.
Substances without classification may have community workplace exposure limits available.

SECTION 4: First aid measures

Description of first aid measures:

Inhalation:
Move to fresh air. If symptoms persist, seek medical advice.

Skin contact:
Rinse with running water and soap.
Seek medical advice.

Eye contact:
Rinse immediately with plenty of running water (for 10 minutes). Seek medical attention if necessary.

Ingestion:
Rinse out mouth, drink 1-2 glasses of water, do not induce vomiting.
Seek medical advice.

Most important symptoms and effects, both acute and delayed:
SKIN: Rash, Urticaria.

Indication of any immediate medical attention and special treatment needed:
See section: Description of first aid measures

SECTION 5: Firefighting measures

Extinguishing media:
Suitable extinguishing media:
Carbon dioxide, foam, powder

Special hazards arising from the substance or mixture:
Oxides of carbon, oxides of nitrogen, irritating organic vapors.

Advice for firefighters:
Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:
Avoid skin and eye contact.
Ensure adequate ventilation.

Environmental precautions:
Do not let product enter drains.

Methods and material for containment and cleaning up:
For small spills wipe up with paper towel and place in container for disposal.
For large spills absorb onto inert absorbent material and place in sealed container for disposal.

Reference to other sections:
See advice in chapter 8

SECTION 7: Handling and storage

Precautions for safe handling:
Use only in well-ventilated areas.
Prolonged or repeated skin contact should be avoided to minimise any risk of sensitisation.

Hygiene measures:
Wash hands before work breaks and after finishing work.
Do not eat, drink or smoke while working.
Good industrial hygiene practices should be observed.

Conditions for safe storage, including any incompatibilities:
Store in original containers at 8-21°C (46.4-69.8°F) and do not return residual materials to containers as contamination may reduce the shelf life of the bulk product.

Specific end use(s):
activator

SECTION 8: Exposure controls/personal protection

Control parameters:
Valid for
Great Britain

None

Exposure controls:

Respiratory protection:
Use only in well-ventilated areas.

Hand protection:
Chemical-resistant protective gloves (EN 374).
Suitable materials for short-term contact or splashes (recommended: at least protection index 2, corresponding to > 30 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced.

Eye protection:
Wear protective glasses.

Skin protection:
Wear suitable protective clothing.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties:

Appearance	liquid liquid green
Odor	characteristic
pH	No data available / Not applicable
Initial boiling point	Not applicable
Flash point	> 100 °C (> 212 °F)
Decomposition temperature	No data available / Not applicable
Vapour pressure	not applicable
Density ()	1,05 - 1,09 g/cm3
Bulk density	No data available / Not applicable
Viscosity	No data available / Not applicable
Viscosity (kinematic)	No data available / Not applicable
Explosive properties	No data available / Not applicable
Solubility (qualitative) (Solvent: Water)	Not miscible
Solubility (qualitative) (Solvent: Acetone)	partially soluble
Solidification temperature	No data available / Not applicable
Melting point	No data available / Not applicable
Flammability	No data available / Not applicable
Auto-ignition temperature	No data available / Not applicable
Explosive limits	No data available / Not applicable
Partition coefficient: n-octanol/water	No data available / Not applicable
Evaporation rate	No data available / Not applicable
Vapor density	No data available / Not applicable
Oxidising properties	No data available / Not applicable

Other information:

No data available / Not applicable

SECTION 10: Stability and reactivity

Reactivity:
Reaction with strong acids.
Reacts with strong oxidants.

Chemical stability:
Stable under recommended storage conditions.

Possibility of hazardous reactions:
See section reactivity

Conditions to avoid:
Stable

Hazardous decomposition products:
Irritating organic vapours.

SECTION 11: Toxicological information

General toxicological information:
The preparation is classified based on the conventional method outlined in Article 6(1)(a) of Directive 1999/45/EC. Relevant available health/ecological information for the substances listed under Section 3 is provided in the following.

Oral toxicity:
This material is considered to have low toxicity if swallowed.

Inhalative toxicity:
Due to the low volatility of the product there are no hazards associated with inhalation under normal conditions of use

Skin irritation:
Prolonged or repeated contact may cause skin irritation.

Eye irritation:
Prolonged or repeated contact may cause eye irritation.

Sensitizing:
May cause sensitization by skin contact.

Skin corrosion/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Limonene, D- 5989-27-5	moderately irritating	4 h	rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

SECTION 12: Ecological information

General ecological information:
The preparation is classified based on the conventional method outlined in Article 6(1)(a) of Directive 1999/45/EC. Relevant available health/ecological information for the substances listed under Section 3 is provided in the following.

Ecotoxicity:
Harmful to aquatic organisms.
May cause long-term adverse effects in the aquatic environment.
Do not empty into drains / surface water / ground water.

Mobility:
Cured adhesives are immobile.

Persistence and Biodegradability:
No data available.

Bioaccumulative potential:
Does not bioaccumulate.

Toxicity:

Hazardous components CAS-No.	Value type	Value	Acute Toxicity Study	Exposure time	Species	Method
Hydroxypropyl methacrylate 27813-02-1	LC50	493 mg/l	Fish	48 h	Leuciscus idus melanotus	
Limonene, D- 5989-27-5	LC50	702 µg/l	Fish	96 h	Pimephales promelas	OECD Guideline 203 (Fish, Acute Toxicity Test)
Limonene, D- 5989-27-5	EC50	577 µg/l	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)

Persistence and degradability:

Hazardous components CAS-No.	Result	Route of application	Degradability	Method

Hydroxypropyl methacrylate 27813-02-1	readily biodegradable	aerobic	94,2 %	OECD Guideline 301 E (Ready biodegradability: Modified OECD Screening Test)
Limonene, D- 5989-27-5	readily biodegradable		41 - 98 %	OECD Guideline 301 C (Ready Biodegradability: Modified MITI Test (I))

Bioaccumulative potential / Mobility in soil:

Hazardous components CAS-No.	LogKow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method
Hydroxypropyl methacrylate 27813-02-1	0,97					
Limonene, D- 5989-27-5	4,57					

SECTION 13: Disposal considerations

Waste treatment methods:

Product disposal:

Dispose of in accordance with local and national regulations.
Contribution of this product to waste is very insignificant in comparison to article in which it is used

Disposal of uncleaned packages:

After use, tubes, cartons and bottles containing residual product should be disposed of as chemically contaminated waste in an authorised legal land fill site or incinerated.

Waste code

08 04 09 waste adhesives and sealants containing organic solvents and other dangerous substances

SECTION 14: Transport information

General information:

Not hazardous according to RID, ADR, ADNR, IMDG, IATA-DGR.

SECTION 15: Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

VOC content (1999/13/EC) < 5 %

SECTION 16: Other information

The labelling of the product is indicated in Section 2. The full text of all abbreviations indicated by codes in this safety data sheet are as follows:

R10 Flammable.
R22 Harmful if swallowed.
R36 Irritating to eyes.
R38 Irritating to skin.
R43 May cause sensitisation by skin contact.
R50 Very toxic to aquatic organisms.
R53 May cause long-term adverse effects in the aquatic environment.

H226 Flammable liquid and vapour.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Further information:

This information is based on our current level of knowledge and relates to the product in the state in which it is delivered. It is intended to describe our products from the point of view of safety requirements and is not intended to guarantee any particular properties.

This safety data sheet was prepared in accordance with Council Directive 67/548/EEC and it's subsequent amendments, and Commission Directive 1999/45/EC.

SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL AERO HF**
Product Description: Base Oil and Additives
Product Code: 201550401010, 490128-00, 970444
Intended Use: Aviation hydraulic oil

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
22777 Springwoods Village Parkway
Spring, TX. 77253 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300 or 703-527-3887 CHEMTREC
Product Technical Information	800-662-4525
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 HAZARDS IDENTIFICATION

This material is hazardous according to regulatory guidelines (see (M)SDS Section 15).

CLASSIFICATION:

Flammable liquid: Category 4.
Aspiration toxicant: Category 1.

LABEL:
Pictogram:

Signal Word: Danger

Hazard Statements:
H227: Combustible liquid. H304: May be fatal if swallowed and enters airways.

Precautionary Statements:
P210: Keep away from flames and hot surfaces. -- No smoking. P273: Avoid release to the environment. P280: Wear protective gloves and eye / face protection.P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P331: Do NOT induce vomiting. P370 + P378: In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish.P403 + P235: Store in a well-ventilated place. Keep cool. P405: Store locked up.P501: Dispose of contents and container in accordance with local regulations.

Other hazard information:

HAZARD NOT OTHERWISE CLASSIFIED (HNOC): None as defined under 29 CFR 1910.1200.

PHYSICAL / CHEMICAL HAZARDS

Material can accumulate static charges which may cause an ignition. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Combustible.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

ENVIRONMENTAL HAZARDS

No significant hazards.

NFPA Hazard ID:	Health:	1	Flammability:	2	Reactivity:	0
HMIS Hazard ID:	Health:	1*	Flammability:	2	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
2,6-DI-TERT-BUTYL-P-CRESOL	128-37-0	0.1 - < 1%	H400(M factor 1), H410(M factor 1)
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT	64742-47-8	5 - < 10%	H304
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	64742-53-6	50 - < 70%	H227, H304
HYDROTREATED MIDDLE DISTILLATE (PETROLEUM)	64742-46-7	20 - < 30%	H304
TRIPHENYL PHOSPHATE	115-86-6	0.1 - < 0.25%	H400(M factor 1), H410(M factor 1)

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (i).

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Combustible. Pressurized mists may form a flammable mixture.

Hazardous Combustion Products: Aldehydes, Incomplete combustion products, Oxides of carbon, Phosphorus oxides, Smoke, Fume, Sulfur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: >82°C (180°F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL: 7.0 [Estimated]
Autoignition Temperature: >225°C (437°F)

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable

regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: respiratory protection will be necessary only in special cases, e.g., formation of mists. Half-face or full-face respirator with filter(s) for dust/organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to hydrocarbons are recommended. Gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid contact with skin. Avoid prolonged breathing of mists and heated vapor. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static

accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be grounded and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit / Standard			NOTE	Source
2,6-DI-TERT-BUTYL-P-CRESOL	Inhalable fraction and vapor	TWA	2 mg/m3		N/A	ACGIH
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT [total hydrocarbon vapor]	Non-Aerosol	TWA	200 mg/m3		Skin	ACGIH
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Mist.	TWA	5 mg/m3		N/A	OSHA Z1
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Inhalable fraction.	TWA	5 mg/m3		N/A	ACGIH
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	Mist.	TWA	5 mg/m3		N/A	ACGIH
HYDROTREATED MIDDLE DISTILLATE (PETROLEUM)	Mist.	TWA	5 mg/m3		N/A	OSHA Z1
HYDROTREATED MIDDLE DISTILLATE (PETROLEUM)	Inhalable fraction.	TWA	5 mg/m3		N/A	ACGIH
TRIPHENYL PHOSPHATE		TWA	3 mg/m3		N/A	OSHA Z1
TRIPHENYL PHOSPHATE		TWA	3 mg/m3		N/A	ACGIH

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following are recommended: 5 mg/m^3 - ACGIH TLV (inhalable fraction), 5 mg/m^3 - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions.

Control measures to consider:
Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
If prolonged or repeated contact is likely, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Red

Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.88
Flammability (Solid, Gas): N/A
Flash Point [Method]: >82°C (180°F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL: 7.0 [Estimated]
Autoignition Temperature: >225°C (437°F)
Boiling Point / Range: N/D
Decomposition Temperature: N/D
Vapor Density (Air = 1): N/D
Vapor Pressure: [N/D at 20 °C]
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): N/D
Solubility in Water: Negligible
Viscosity: 13.8 cSt (13.8 mm2/sec) at 40 °C | 5.1 cSt (5.1 mm2/sec) at 100°C [ASTM D 445]
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -60°C (-76°F) [ASTM D97]
DMSO Extract (mineral oil only), IP-346: < 3 %wt

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: See sub-sections below.

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Open flames and high energy ignition sources.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.

Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	May dry the skin leading to discomfort and dermatitis. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
2,6-DI-TERT-BUTYL-P-CRESOL	Oral Lethality: LD50 0.89 g/kg (Rat)

OTHER INFORMATION

For the product itself:

Repeated and/or prolonged exposure may cause irritation to the skin, eyes, or respiratory tract. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Contains:

Base oil severely refined: Not carcinogenic in animal studies. Representative material passes IP-346, Modified Ames test, and/or other screening tests. Dermal and inhalation studies showed minimal effects; lung non-specific infiltration of immune cells, oil deposition and minimal granuloma formation. Not sensitizing in test animals.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

Less volatile component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Components -- Expected to be inherently biodegradable

BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be

completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT)

Proper Shipping Name: COMBUSTIBLE LIQUID, N.O.S. (Distillates (Petroleum), Hydrotreated Light)
Hazard Class & Division: COMBUSTIBLE LIQUID
ID Number: NA1993
Packing Group: III
ERG Number: 128
Label(s): NONE
Transport Document Name: NA1993, COMBUSTIBLE LIQUID, N.O.S. (Distillates (Petroleum), Hydrotreated Light), COMBUSTIBLE LIQUID, PG III

Footnote: This material is not regulated under 49 CFR in a container of 119 gallon capacity or less when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: This material is considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, IECSC, KECI, PICCS, TCSI, TSCA

EPCRA SECTION 302: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: Fire. Immediate Health. Delayed Health.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT	64742-47-8	1, 17, 18
HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (PETROLEUM)	64742-53-6	1, 4, 13, 17, 18
HYDROTREATED MIDDLE DISTILLATE (PETROLEUM)	64742-46-7	1, 4, 17, 18

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H227: Combustible liquid; Flammable Liquid, Cat 4
H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 01: Company Mailing Address information was modified.
Section 05: Hazardous Combustion Products information was modified.
Section 15: List Citations Table information was modified.
Section 15: National Chemical Inventory Listing information was modified.
Section 14: Marine Pollutant information was modified.
Composition: Component Table information was modified.
Section 08: Exposure Limits Table information was modified.
Section 16: Revision Information - Implementation of GHS requirements phrase. information was deleted.

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Internal Use Only

MHC: 2A, 0, 0, 0, 1, 1 PPEC: C

DGN: 2005457XUS (552975)

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607234-00 MOBIL GLYGOYLE 11

1. PRODUCT AND COMPANY IDENTIFICATION

APPROVAL DATE: 01/01/95

PRODUCT NAME: MOBIL GLYGOYLE 11
SUPPLIER: MOBIL OIL CORP.
AMERICAS MARKETING AND REFINING
3225 GALLOWS RD.
FAIRFAX, VA 22037

24 - Hour Emergency (call collect):	609-737-4411	
Product and MSDS Information:	800-662-4525	703-849-5700
CHEMTREC:	800-424-9300	202-483-7616

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAMES AND SYNONYMS: SYN. HYDROCARBONS AND ADDITIVES

INGREDIENTS CONSIDERED HAZARDOUS TO HEALTH:

Substance Name	Wt%
POLYPROPYLENE GLYCOLS (25322-69-4)	90-100

See Section 15 for European Label Information.

See Section 8 for exposure limits (if applicable).

3. HAZARDS IDENTIFICATION

US OSHA HAZARD COMMUNICATION STANDARD: Product assessed in accordance with OSHA 29 CFR 1910.1200 and determined not to be hazardous.
EFFECTS OF OVEREXPOSURE: No significant effects expected.
EMERGENCY RESPONSE DATA: Dark Amber Liquid. DOT ERG No. - NA

4. FIRST AID MEASURES

EYE CONTACT: Flush thoroughly with water. If irritation occurs, call a physician.
SKIN CONTACT: Wash contact areas with soap and water.
INHALATION: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance and call a physician. If breathing has stopped, use mouth to mouth resuscitation.
INGESTION: Not expected to be a problem. However, if greater than 1/2 liter(pint) ingested, immediately give 1 to 2 glasses of water and call a physician, hospital emergency room or poison control center for assistance. Do not induce vomiting or give anything by mouth to an unconscious person.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Carbon dioxide, foam, dry chemical and water fog.
SPECIAL FIRE FIGHTING PROCEDURES: Water or foam may cause frothing. Use water to keep fire exposed containers cool. Water spray may be used to flush spills away from exposure. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply.
SPECIAL PROTECTIVE EQUIPMENT: For fires in enclosed areas, fire fighters must use self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None. Flash Point C(F): > 210(410) (ASTM D-93). Flammable limits - LEL: NA, UEL: NA.
NFPA HAZARD ID: Health: 0, Flammability: 1, Reactivity: 0
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES: Report spills as required to appropriate authorities. U. S. Coast Guard regulations require immediate reporting of spills that could reach any waterway including intermittent dry creeks. Report spill to Coast Guard toll free number (800) 424-8802. In case of accident or road spill notify CHEMTREC (800) 424-9300.
PROCEDURES IF MATERIAL IS RELEASED OR SPILLED: Adsorb on fire retardant treated sawdust, diatomaceous earth, etc. Shovel up and dispose of at an appropriate waste disposal facility in accordance with current applicable laws and regulations, and product characteristics at time of disposal.
ENVIRONMENTAL PRECAUTIONS: Prevent spills from entering storm sewers or drains and contact with soil.
PERSONAL PRECAUTIONS: See Section 8

7. HANDLING AND STORAGE

HANDLING: No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.
STORAGE: Do not store in open or unlabelled containers. Store away from strong oxidizing agents or combustible material.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION: Use in well ventilated area.
RESPIRATORY PROTECTION: No special requirements under ordinary conditions of use and with adequate ventilation.
EYE PROTECTION: Normal industrial eye protection practices should be employed.
SKIN PROTECTION: No special equipment required. However, good personal hygiene practices should always be followed.

		---TWA---		----STEL---		NOTE
Substance Name (CAS-No.)	Source	ppm	mg/m3	ppm	mg/m3	
POLYPROPYLENE GLYCOLS (25322-69-4)	MOBIL		10			

NOTE: Limits shown for guidance only. Follow applicable regulations.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical properties are given below. Consult Product Data Sheet for specific details.

APPEARANCE: Liquid
COLOR: Dark Amber
ODOR: Mild
ODOR THRESHOLD-ppm: NE
pH: NA
BOILING POINT C(F): NE
MELTING POINT C(F): NA
FLASH POINT C(F): > 210(410) (ASTM D-93)
FLAMMABILITY: NE
AUTO FLAMMABILITY: NE
EXPLOSIVE PROPERTIES: NA
OXIDIZING PROPERTIES: NA
VAPOR PRESSURE-mmHg 20 C: NE

(Section continued next page)

VAPOR DENSITY: NE
EVAPORATION RATE: NE
RELATIVE DENSITY, 15/4 C: 1.009
SOLUBILITY IN WATER: Slight
PARTITION COEFFICIENT: NE
VISCOSITY AT 40 C, cSt: 85.0
VISCOSITY AT 100 C, cSt: 12.0
POUR POINT C(F): -29(-20)
FREEZING POINT C(F): NE
VOC: < 2.00 (Wt. %); 0.168 lbs/gal
NA=NOT APPLICABLE NE=NOT ESTABLISHED D=DECOMPOSES

FOR FURTHER TECHNICAL INFORMATION, CONTACT YOUR MARKETING REPRESENTATIVE

10. STABILITY AND REACTIVITY

STABILITY (THERMAL, LIGHT, ETC.): Stable.
CONDITIONS TO AVOID: Extreme heat.
INCOMPATIBILITY (MATERIALS TO AVOID): Strong oxidizers.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL DATA

---ACUTE TOXICOLOGY---

ORAL TOXICITY (RATS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

DERMAL TOXICITY (RABBITS): Practically non-toxic (LD50: greater than 2000 mg/kg). ---Based on testing of similar products and/or the components.

INHALATION TOXICITY (RATS): Not established

EYE IRRITATION (RABBITS): Practically non-irritating. (Draize score: greater than 6 but 15 or less). ---Based on testing of similar products and/or the components.

SKIN IRRITATION (RABBITS): Practically non-irritating. (Primary Irritation Index: greater than 0.5 but less than 3). ---Based on testing of similar products and/or the components.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE AND EFFECTS: Not established.

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Product is suitable for burning in an enclosed, controlled burner for fuel value or disposal by supervised incineration. Such burning may be limited pursuant to the Resource Conservation and Recovery Act. In addition, the product is suitable for processing by an approved recycling facility or can be disposed of at an appropriate government waste disposal facility. Use of these methods is subject to user compliance with applicable laws and regulations and consideration of product characteristics at time of disposal.

RCRA INFORMATION: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity, or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

14. TRANSPORT INFORMATION

USA DOT: NOT REGULATED BY USA DOT.

IMO: NOT REGULATED BY IMO.

IATA: NOT REGULATED BY IATA.

15. REGULATORY INFORMATION

Governmental Inventory Status: All components comply with TSCA.

EU Labeling: EU labeling not required.

U.S. Superfund Amendments and Reauthorization Act (SARA) Title III:
This product contains no "EXTREMELY HAZARDOUS SUBSTANCES".

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

This product contains no chemicals reportable under SARA (313) toxic release program.

(Section continued next page)

The following product ingredients are cited on the lists below:

CHEMICAL NAME	CAS NUMBER	LIST CITATIONS
POLYPROPYLENE GLYCOL	25322-69-4	1, 23

--- REGULATORY LISTS SEARCHED ---

1 = ACGIH ALL	6 = IARC 1	11 = TSCA 4	17 = CA P65	22 = MI 293
2 = ACGIH A1	7 = IARC 2A	12 = TSCA 5a2	18 = CA RTK	23 = MN RTK
3 = ACGIH A2	8 = IARC 2B	13 = TSCA 5e	19 = FL RTK	24 = NJ RTK
4 = NTP CARC	9 = OSHA CARC	14 = TSCA 6	20 = IL RTK	25 = PA RTK
5 = NTP SUS	10 = OSHA Z	15 = TSCA 12b	21 = LA RTK	26 = RI RTK

Code key: CARC = Carcinogen; SUS = Suspected Carcinogen

16. OTHER INFORMATION

USE: INDUSTRIAL OIL

NOTE: MOBIL PRODUCTS ARE NOT FORMULATED TO CONTAIN PCBS.

Please call the Customer Response Center on 800-662-4525 for formulation disclosure.

****

For Internal Use Only: MHC: 1* 1* NE 1* 1*, MPPEC: A, REQ: US - MARKETING, SAFE USE: L

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(Section continued next page)

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SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL GLYGOYLE 30**
Product Description: Synthetic Base Stocks and Additives
Product Code: 201560505030, 607259-00, 97M461
Intended Use: Synthetic lubricants

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
22777 Springwoods Village Parkway
Spring, TX. 77389 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300 or 703-527-3887 CHEMTREC
Product Technical Information	800-662-4525
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 HAZARDS IDENTIFICATION

This material is not hazardous according to regulatory guidelines (see (M)SDS Section 15).

Other hazard information:

HAZARD NOT OTHERWISE CLASSIFIED (HNOC): None as defined under 29 CFR 1910.1200.

PHYSICAL / CHEMICAL HAZARDS

No significant hazards.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

ENVIRONMENTAL HAZARDS

No significant hazards.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
BENZENAMINE, N-PHENYL-, REACTION PRODUCTS WITH 2,4,4-TRIMETHYLPENTENE	68411-46-1	1 - < 5%	H402, H412
OCTANOIC ACID, COMPOUND WITH 1-OCTANAMINE (1:1)	17463-34-2	0.1 - < 1%	H302, H314(1B)
TRIPHENYL PHOSPHATE	115-86-6	< 0.25%	H400(M factor 1), H410(M factor 1)

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (i).

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Incomplete combustion products, Oxides of carbon, Sulfur oxides, Aldehydes

FLAMMABILITY PROPERTIES

Flash Point [Method]: >210°C (410°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Warn other shipping. Material will sink. Remove material, as much as possible, using mechanical equipment.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit / Standard			NOTE	Source
TRIPHENYL PHOSPHATE		TWA	3 mg/m3		N/A	OSHA Z1
TRIPHENYL PHOSPHATE		TWA	3 mg/m3		N/A	ACGIH

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following are recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction), 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Brown
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 20 °C): 1.006 [ASTM D1298]
Flammability (Solid, Gas): N/A
Flash Point [Method]: >210°C (410°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (601°F)
Decomposition Temperature: N/D
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A

Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 220 cSt (220 mm2/sec) at 40 °C | 30.25 cSt (30.25 mm2/sec) at 100°C [ASTM D 445]
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -30°C (-22°F) [ASTM D97]

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: See sub-sections below.

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data	Not expected to be a germ cell mutagen. Based on assessment of

for material.	the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

OTHER INFORMATION

Contains:
Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitizing in test animals and humans.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

ECOLOGICAL DATA

Ecotoxicity

Test	Duration	Organism Type	Test Results

Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	ErL50 >100 mg/l: data for similar materials
Aquatic - Chronic Toxicity	21 day(s)	Daphnia magna	NOELR 1 mg/l: data for similar materials
Aquatic - Acute Toxicity	96 hour(s)	Oncorhynchus mykiss	LL0 101 mg/l: data for similar materials
Aquatic - Acute Toxicity	48 hour(s)	Daphnia magna	EL0 103 mg/l: data for similar materials

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT): Not Regulated for Land Transport

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: This material is not considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, IECSC, KECI, PICCS, TSCA

PRODUCT REGISTRATION STATUS: USA

EPCRA SECTION 302: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H302: Harmful if swallowed; Acute Tox Oral, Cat 4
H314(1B): Causes severe skin burns and eye damage; Skin Corr/Irritation, Cat 1B
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
H402: Harmful to aquatic life; Acute Env Tox, Cat 3
H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1
H412: Harmful to aquatic life with long lasting effects; Chronic Env Tox, Cat 3

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Updates made in accordance with implementation of GHS requirements.

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SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

As of the revision date above, this (M)SDS meets the regulations in the United Kingdom & Ireland.

PRODUCT

Product Name: **MOBIL GLYGOYLE HE 320**
Product Description: Polyglycol
Product Code: 201560401520, 400623, 607317-60
Intended Use: Lubricant

COMPANY IDENTIFICATION

Supplier: **EXXONMOBIL LUBRICANTS & SPECIALTIES EUROPE, A DIVISION OF EXXONMOBIL PETROLEUM & CHEMICAL, BVBA (EMPC)**
POLDERDIJKWEG
B-2030 Antwerpen
Belgium

24 Hour Environmental / Health Emergency Telephone (UK) 01372 222 000 / (IRELAND) 44 1372 222 000
e-mail SDS-UK@EXXONMOBIL.COM

SECTION 2 HAZARDS IDENTIFICATION

This material is dangerous according to regulatory guidelines (see (M)SDS Section 15).

CLASSIFICATION: | R52/53 |

HEALTH HAZARDS

Low order of toxicity. May be irritating to the eyes, nose, throat, and lungs. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

ENVIRONMENTAL HAZARDS

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Note: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is regulated as a preparation.

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	EINECS / ELINCS	Concentration*	Symbols/Risk Phrases

ALKYLATED DIPHENYL AMINES	68411-46-1	270-128-1	1 - 5%	R52/53
TRIPHENYL PHOSPHATE	115-86-6	204-112-2	0.1 - 1%	N;R50/53

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >275C (527F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Material will sink. Remove material, as much as possible, using mechanical equipment.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Remove debris in path of spill prior to oiling and remove contaminated debris from shoreline and water surface. Dispose of according to local regulations. Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is a static accumulator.

STORAGE

Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit/Standard			Note	Source	Year
TRIPHENYL PHOSPHATE		STEL	6 mg/m3			UK EH40	2007
TRIPHENYL PHOSPHATE		TWA	3 mg/m3			UK EH40	2007
TRIPHENYL PHOSPHATE		TWA	3 mg/m3			ACGIH	2008

Note: Information about recommended monitoring procedures can be obtained from the relevant agency(ies)/institute(s):

UK Health and Safety Executive (HSE)

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1

for additional data.

GENERAL INFORMATION

Physical State: Liquid
Colour: brown
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 1.069
Flash Point [Method]: >275C (527F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D
Boiling Point / Range: > 316C (601F)
Vapour Density (Air = 1): N/A
Vapour Pressure: < 0.013 kPa (0.1 mm Hg) at 20℃
Evaporation Rate (N-Butyl Acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): < 3
Solubility in Water: Complete
Viscosity: 320 cSt (320 mm²/sec) at 40℃ | 54.6 cSt (54.6 mm²/sec) at 100C
Oxidising properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -30℃ (-22℉)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidisers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

Route of Exposure	Conclusion / Remarks
INHALATION	
Toxicity: LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or

	lungs. Based on assessment of the components.
INGESTION	
Toxicity: LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity: LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation: No end point data.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

Additional information is available by request.

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

Majority of components -- Expected to remain in water or migrate through soil.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Majority of components -- Expected to be persistent.

BIOACCUMULATION POTENTIAL

Majority of components -- Potential to bioaccumulate is low.

ECOLOGICAL DATA

Component	Acute Aquatic Toxicity
TRIPHENYL PHOSPHATE	L(E)C50 >0.1 - 1 mg/L

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

European Waste Code: 13 02 06

NOTE: These codes are assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste producers need to assess the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code(s).

This material is considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (ADR/RID) : Not Regulated for Land Transport

INLAND WATERWAYS (ADNR) : Not Regulated for Inland Waterways Transport

SEA (IMDG) : Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA) : Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

Material is dangerous as defined by the EU Dangerous Substances/Preparations Directives.

CLASSIFICATION: Dangerous for the environment.

EU LABELING: No symbol required.

Nature of Special Risk: R52/53; Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Advice: S61; Avoid release to the environment. Refer to special instructions/safety data sheets.

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Complies with the following national/regional chemical inventory requirements: AICS, EINECS, TSCA

SECTION 16	OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE RISK CODES CONTAINED IN SECTION 2 AND 3 OF THIS DOCUMENT (for information only):
R50/53; Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R52/53; Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:
Section 06: Notification Procedures - Header was modified.
Section 13: Empty Container Warning was modified.
Section 09: Phys/Chem Properties Note was modified.
Section 09: Boiling Point ºC(ºF) was modified.
Section 08: Hand Protection was modified.
Section 08: Environmental Control - Note was modified.
Section 05: Hazardous Combustion Products was modified.
Section 06: Accidental Release - Spill Management - Water was modified.
Section 09: Relative Density - Header was modified.
Section 09: Flash Point ºC(ºF) was modified.
Section 09: Viscosity was modified.
Section 08: Environmental Control - Note was modified.
Section 08: Exposure Limits Table was modified.
Section 01: Company Contact Methods Sorted by Priority was modified.
Section 12: Environmental component tox table in section 12 was added.
Section 12: Environmental component tox table in section 12 was added.
Section 12: Environmental component tox table in section 12 was added.
Section 12: Ecological data - Header was added.

%%revision_comment%%

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included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law, re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only

MHC: 0, 0, 0, 0, 0, 1 PPEC: A

DGN: 2008607XGB (554880)

SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **MOBIL SHC 630**
Product Description: Synthetic Base Stocks and Additives
Product Code: 201560500550, 602953-00, 970782
Intended Use: Circulating/gear oil

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
22777 Springwoods Village Parkway
Spring, TX. 77389 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300 or 703-527-3887 CHEMTREC
Product Technical Information	800-662-4525
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 HAZARDS IDENTIFICATION

This material is not hazardous according to regulatory guidelines (see (M)SDS Section 15).

Other hazard information:

HAZARD NOT OTHERWISE CLASSIFIED (HNOC): None as defined under 29 CFR 1910.1200.

PHYSICAL / CHEMICAL HAZARDS

No significant hazards.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

ENVIRONMENTAL HAZARDS

No significant hazards.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
1-DECENE, HOMOPOLYMER HYDROGENATED	68037-01-4	20 - < 30%	H304
TRIPHENYL PHOSPHATE	115-86-6	< 0.25%	H400(M factor 1), H410(M factor 1)

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (i).

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Oxides of carbon, Smoke, Fume, Sulfur oxides, Aldehydes, Incomplete combustion products

FLAMMABILITY PROPERTIES

Flash Point [Method]: >210°C (410°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could

ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit / Standard			NOTE	Source
1-DECENE, HOMOPOLYMER HYDROGENATED	Aerosols (thoracic fraction)	TWA	5 mg/m3		N/A	ExxonMobil
TRIPHENYL PHOSPHATE		TWA	3 mg/m3		N/A	OSHA Z1
TRIPHENYL PHOSPHATE		TWA	3 mg/m3		N/A	ACGIH

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following are recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction), 5 mg/m³ - OSHA PEL.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Orange
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.854
Flammability (Solid, Gas): N/A
Flash Point [Method]: >210°C (410°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F)
Decomposition Temperature: N/D
Vapor Density (Air = 1): > 2 at 101 kPa
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C
Evaporation Rate (n-butyl acetate = 1): N/D

pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 220 cSt (220 mm2/sec) at 40 °C | 28.5 cSt (28.5 mm2/sec) at 100°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION
Freezing Point: N/D
Melting Point: N/A
Pour Point: -36°C (-33°F)

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: See sub-sections below.

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.

Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

OTHER INFORMATION

Contains:
Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitizing in test animals and humans.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.
Material -- Not expected to demonstrate chronic toxicity to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

ECOLOGICAL DATA

Ecotoxicity

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	96 hour(s)	Oncorhynchus mykiss	LL50 1003 mg/l: data for similar materials
Aquatic - Chronic Toxicity	21 day(s)	Daphnia magna	NOELR 1 mg/l: data for similar materials

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrositivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT): Not Regulated for Land Transport

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: This material is not considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.

Listed or exempt from listing/notification on the following chemical inventories: TSCA
Special Cases:

Inventory	Status
AICS	Restrictions Apply
IECSC	Restrictions Apply
KECI	Restrictions Apply
NDSL	Restrictions Apply

PRODUCT REGISTRATION STATUS: USA

EPCRA SECTION 302: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
PHENOL, 4,4-METHYLENEBIS(2,6-BIS(1,1-DIMETHYLETHYL)-	118-82-1	5

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1

H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Updates made in accordance with implementation of GHS requirements.

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DGN: 2007966XUS (1011899)

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MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

As of the revision date above, this (M)SDS meets the regulations in India.

PRODUCT

Product Name: **MOBILGEAR SHC 220**
Product Description: Synthetic Base Stocks and Additives
Product Code: 201560402515, 610808
Intended Use: Gear oil

COMPANY IDENTIFICATION

Supplier: **ExxonMobil Lubricants Private Limited**
4th Floor, Building Number 10, Tower C
DLF Cyber City, DLF Phase-II
Gurgaon - 122 002
Haryana India

Supplier General Contact +91-124-4951300

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*	Symbols/Risk Phrases
DITRIDECYL ADIPATE	16958-92-2	20 - 30%	None

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

HEALTH HAZARDS

Low order of toxicity. Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: >210Â°C (410Â°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable

regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit/Standard			Note	Source
DITRIDECYL ADIPATE		TWA	5 mg/m3			ExxonMobil

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following is recommended: 5 mg/mÂ³ - ACGIH TLV (inhalable fraction).

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Adequate ventilation should be provided so that exposure limits are not exceeded.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation. Particulate

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use. Nitrile,Viton

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Colour: Amber
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 Â°C): 0.874
Flash Point [Method]: >210Â°C (410Â°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 0.9 UEL: 7.0
Autoignition Temperature: N/D
Boiling Point / Range: > 316Â°C (600Â°F) [Estimated]
Vapour Density (Air = 1): > 2 at 101 kPa [Estimated]
Vapour Pressure: < 0.013 kPa (0.1 mm Hg) at 20 Â°C [Estimated]
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5 [Estimated]
Solubility in Water: Negligible
Viscosity: 220 cSt (220 mm2/sec) at 40ÂºC
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -36Â°C (-33Â°F)
Decomposition Temperature: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidisers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Route of Exposure	Conclusion / Remarks

Inhalation	
Toxicity (Rat): LC50 > 5000 mg/m3	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Repeated and/or prolonged exposure may cause irritation to the skin, eyes, or respiratory tract.

Contains:

Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitising in test animals and humans.

Additional information is available by request.

IARC Classification:
The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = IARC 1 2 = IARC 2A 3 = IARC 2B

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND : Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

Material is not hazardous as defined by the EU Dangerous Substances/Preparations Directives.

EU LABELING: Not regulated according to EC Directives

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Complies with the following national/regional chemical inventory requirements: DSL, TSCA
Special Cases:

Inventory	Status

AICS	Restrictions Apply
ELINCS	Restrictions Apply
IECSC	Restrictions Apply
KECI	Restrictions Apply

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS: Revision Changes:
Section 13: Disposal Considerations - Disposal Recommendations was modified.
Section 09: Phys/Chem Properties Note was modified.
Section 09: Boiling Point ÂºC(ÂºF) was modified.
Section 09: Flash Point ÂºC(ÂºF) was modified.
Section 09: n-Octanol/Water Partition Coefficient was modified.
Section 08: Comply with applicable regulations phrase was modified.
Section 09: Vapour Pressure was modified.
Section 01: Company Mailing Address was modified.
Section 01: Company Mailing Address was modified.
Section 01: Company Mailing Address was modified.
Section 09: Relative Density - Header was modified.
Section 09: Flash Point ÂºC(ÂºF) was modified.
Section 09: Viscosity was modified.
Section 08: Exposure limits/standards was modified.
Section 01: Company Contact Methods Sorted by Priority was modified.
Section 09: Decomposition Temperature was added.
Section 09: Decomposition Temp - Header was added.
Section 09: Vapour Pressure was added.
Section 08: Exposure Limit Values - Header was added.
Section 08: OEL Table - Form Column - Header was added.
Section 08: OEL Table - Limit Column - Header was added.
Section 08: OEL Table - Notation Column - Header was added.
Section 08: OEL Table - Source Column - Header was added.
Section 08: OEL Table - Substance Name Column - Header was added.
Section 08: Exposure Limits Table was added.
Section 08: Exposure Limit Values - Header was added.
Section 08: OEL Table - Substance Name Column - Header was deleted.
Section 08: OEL Table - Limit Column - Header was deleted.
Section 08: OEL Table - Notation Column - Header was deleted.
Section 08: Exposure Limit Values - Header was deleted.
Section 08: Exposure Limit Values - Table Header was deleted.
Section 08: OEL Table - Source Column - Header was deleted.
Section 08: OEL Table - Year Column - Header was deleted.
Section 08: Exposure Limits Table was deleted.
Section 08: OEL Table - Form Column - Header was deleted.

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(AP Core)

DGN: 2009053XIN (1012223)

SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: (see Section 16 for Synonyms) **MOBILITH SHC 220**
Product Description: Synthetic Base Stocks and Additives
Product Code: 2015A0204040, 644021-00, 970409
Intended Use: Grease

COMPANY IDENTIFICATION

Supplier: **EXXON MOBIL CORPORATION**
22777 Springwoods Village Parkway
Spring, TX. 77389 USA

24 Hour Health Emergency	609-737-4411
Transportation Emergency Phone	800-424-9300 or 703-527-3887 CHEMTREC
Product Technical Information	800-662-4525
MSDS Internet Address	http://www.exxon.com, http://www.mobil.com

SECTION 2 HAZARDS IDENTIFICATION

This material is not hazardous according to regulatory guidelines (see (M)SDS Section 15).

Other hazard information:

HAZARD NOT OTHERWISE CLASSIFIED (HNOC): None as defined under 29 CFR 1910.1200.

PHYSICAL / CHEMICAL HAZARDS

No significant hazards.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. Excessive exposure may result in eye, skin, or respiratory irritation.

ENVIRONMENTAL HAZARDS

No significant hazards.

NFPA Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0
HMIS Hazard ID:	Health:	0	Flammability:	1	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
1H-BENZOTRIAZOLE-1-METHANAMINE, N,N-BIS(2-ETHYLHEXYL)-METHYL-	94270-86-7	0.1 - < 1%	H315, H317, H401, H411
BENZENAMINE, N-PHENYL-, REACTION PRODUCTS WITH 2,4,4-TRIMETHYLPENTENE	68411-46-1	1 - < 5%	H402, H412
LITHIUM HYDROXIDE MONOHYDRATE	1310-66-3	0.1 - < 1%	H302, H314(1B)
LITHIUM SALT OF ALIPHATIC ACID	CONFIDENTIAL	1 - < 5%	H302
METHYLENE BIS(DIBUTYLDITHIOCARBAMATE)	10254-57-6	1 - < 5%	H413
ZINC DITHIOPHOSPHATE	68649-42-3	1 - < 2.5%	H315, H318, H401, H411

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (i).

SECTION 4 FIRST AID MEASURES

INHALATION

Under normal conditions of intended use, this material is not expected to be an inhalation hazard.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish

flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Hazardous Combustion Products: Aldehydes, Incomplete combustion products, Oxides of carbon, Smoke, Fume, Sulfur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: >204°C (399°F) [EST. FOR OIL, ASTM D-92 (COC)]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

SPILL MANAGEMENT

Land Spill: Stop leak if you can do it without risk. Scrape up spilled material with shovels into a suitable container for recycle or disposal.

Water Spill: Stop leak if you can do it without risk. Confine the spill immediately with booms. Warn other shipping. Skim from surface.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent small spills and leakage to avoid slip hazard.

Static Accumulator: This material is not a static accumulator.

STORAGE

Do not store in open or unlabelled containers. Keep away from incompatible materials.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit / Standard			NOTE	Source
LITHIUM HYDROXIDE MONOHYDRATE		Ceiling	1 mg/m3		N/A	OARS WEEL

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

No biological limits allocated.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No protection is ordinarily required under normal conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Solid
Form: Semi-fluid
Color: Red
Odor: Characteristic
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.9
Flammability (Solid, Gas): N/D
Flash Point [Method]: >204°C (399°F) [EST. FOR OIL, ASTM D-92 (COC)]
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/D
Boiling Point / Range: > 316°C (600°F) [Estimated]
Decomposition Temperature: N/D
Vapor Density (Air = 1): N/D
Vapor Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C [Estimated]
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5 [Estimated]
Solubility in Water: Negligible
Viscosity: 220 cSt (220 mm2/sec) at 40 °C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/D

NOTE: Most physical properties above are for the oil component in the material.

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: See sub-sections below.

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.
Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	

Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

OTHER INFORMATION

For the product itself:

An ingredient or ingredients that are classified as a skin sensitizer.

Contains:

Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitizing in test animals and humans.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC	3 = IARC 1	5 = IARC 2B
2 = NTP SUS	4 = IARC 2A	6 = OSHA CARC

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: The unused product, in our opinion, is not specifically listed by the EPA as a hazardous waste (40 CFR, Part 261D), nor is it formulated to contain materials which are listed as hazardous wastes. It does not exhibit the hazardous characteristics of ignitability, corrosivity or reactivity and is not formulated with contaminants as determined by the Toxicity Characteristic Leaching Procedure (TCLP). However, used product may be regulated.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (DOT): Not Regulated for Land Transport

LAND (TDG): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

Marine Pollutant: No

AIR (IATA): Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: This material is not considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.

Listed or exempt from listing/notification on the following chemical inventories: AICS, IECSC, KECI, TSCA

Special Cases:

Inventory	Status
NDSL	Restrictions Apply
PICCS	Restrictions Apply

EPCRA SECTION 302: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: None.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
ZINC DITHIOPHOSPHATE	68649-42-3	1 - < 2.5%

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
NAPHTHENIC ACIDS, ZINC SALTS	12001-85-3	15
ZINC DITHIOPHOSPHATE	68649-42-3	13, 15, 17, 19
ZINC NEODECANOATE	27253-29-8	15

--REGULATORY LISTS SEARCHED--

1 = ACGIH ALL	6 = TSCA 5a2	11 = CA P65 REPRO	16 = MN RTK
2 = ACGIH A1	7 = TSCA 5e	12 = CA RTK	17 = NJ RTK
3 = ACGIH A2	8 = TSCA 6	13 = IL RTK	18 = PA RTK
4 = OSHA Z	9 = TSCA 12b	14 = LA RTK	19 = RI RTK
5 = TSCA 4	10 = CA P65 CARC	15 = MI 293	

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H302: Harmful if swallowed; Acute Tox Oral, Cat 4
H314(1B): Causes severe skin burns and eye damage; Skin Corr/Irritation, Cat 1B
H315: Causes skin irritation; Skin Corr/Irritation, Cat 2
H317: May cause allergic skin reaction; Skin Sensitization, Cat 1
H318: Causes serious eye damage; Serious Eye Damage/Irr, Cat 1
H401: Toxic to aquatic life; Acute Env Tox, Cat 2
H402: Harmful to aquatic life; Acute Env Tox, Cat 3
H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2
H412: Harmful to aquatic life with long lasting effects; Chronic Env Tox, Cat 3
H413: May cause long lasting harmful effects to aquatic life; Chronic Env Tox, Cat 4

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Updates made in accordance with implementation of GHS requirements.

SYNONYMS: MOBILITH SHC 220 ELECTROLUBER

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DGN: 2010011XUS (553335)

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Material Safety Datasheet
Glass Products

Date: 16/03/2015

Section 1: Product and company identification

1.1 Product
Multiaxial fabrics constructed from e-glass fibre for composite products.

1.2 Company
Devold AMT AS
N-6030 Langevåg
Norway

Tel + 47 70 19 85 00

Section 2: Composition/information on ingredients.

Material in product.	**Content**
For e-glass fibre	
Fibrous glass (fibre glass continuous filament)	98%-100%
Size (surface coating)	0%-2%
For knitting yarn	
Polyester	98.5%
Sizing	1.5%
For product	
E-glass	98.5%
Polyester	1.5%

Section 3: Identification of risks

- Health risks
  - Eye contact
    This product may cause irritation to eyes. Dust and fibers from this product cause mechanical irritation.
  - Skin contact
    Dust and fibers from this product may cause itching and short-term mechanical irritation.
  - Ingestion
    Dust and fibers from this product may cause mechanical irritation.
  - Inhalation
    Dust and fibers from this product may cause irritation to the nose, throat and respiratory tract.

- Medical conditions aggravated by exposure
  Respiratory or skin conditions that are aggravated by mechanical irritants may be at an increased risk for worsening from exposure to this product.

- General health risk.
  Glass fibre filament is, by the international Agency for Research in cancer, classified in group 3: Not classified as carcinogenic for human beings

Section 4: First Aid.

- Inhalation
  If inhaled, immediately remove the affected person to fresh air. If symptoms persist, get medical attention.
- Eye contact
  Immediately flush eyes with plenty of water for a minimum of 15 minutes. Do not rub or scratch eyes. Rubbing or scratching may cause mechanical damage. If irritation persists get medical attention.
- Skin contact
  In the event of skin contact wash immediately with soap and water. Use a washcloth to help remove fibers To avoid further irritation, do not rub or scratch affected areas. Rubbing or scratching may force fibers into the skin. If irritation persists seek medical attention.
- Ingestion
  Ingestion f this material is unlikely. If this does occur, observe the victim for several days to make sure that intestinal blockage does not occur

Section 5: Fire fighting measures.

Flash point:	None
Flamability classification:	Non- flammable
Upper flammable limit:	Not applicable
Lowe flammable limit:	Not applicable

Extinguishing media
Dry chemical, foam, carbon dioxide and water.

Unusual fire and explosion
None Known

Fire fighting instructions

No special procedures are expected to be required for this product. Use general accepted fire fighting procedures for packaging materials. Use self-contained breathing apparatus and fire fighting protective clothing in a sustained fire.

Hazardous Combustion Products
Primary combustion products are carbon monoxide, carbon dioxide and water. Other undetermined compounds could be released in small quantities.

Section 6: Accidental release measures.

Release of this product to the land, water and air may require reporting to the proper authorities. Refer to local and applicable regulations

- Land spill

Scoop up material and place into a suitable container for disposal as non-hazardous waste.

- Water spill

This material is non hazardous in water.

- Air release.

This material will settle out of the air. If concentrated on land, it can be scooped up for disposal as non-hazardous waste.

Section 7: Handling and storage.

Handling

General: The fabrics should be handled with care.

- Precautions
  - Use adequate protective clothing to protect against skin contact: mask, gloves and goggles
  - Ensure that handling is carried out in a well-ventilated area. Spot extractor fans should be used to avoid excessive dust.
  - Ventilation systems should have a filter to avoid discharge into open air.
  - Insulating varnish may be applied to electronic boards and electrical terminals.
  - Avoid friction that may generate flying debris.

Storage

- Recommended conditions
  - Storage conditions do not affect the stability of the product or increase the danger risks.
  - The product should be stored in a clean dry place away from dust and it original packaging.

Section 8: Exposure controls/personal protection.

- General — If dust is created and ventilation is inadequate it is advised to wear dust mask, eye protection and work clothing.
- Individual protection
  - Respiratory - Dust mask
  - Hands - Gloves (surgical or cotton type)
  - Eyes - Goggles
  - Skin - Protective cream may help.

Section 9: Physical and chemical properties

Physical state	Solid
Form	Fabric
Color	White (white stitching)
Odor	None
pH concentration	N/A
Temperature at which physical state changes	N/A
Decomposition temperature	N/A
Inflammation point	N/A
Self-combusting point	N/A
Explosive characteristics	N/A
Steam pressure	N/A
Solubility	Insoluble fiber.
Radioactivity	N/A

Section 10: Stability and reactivity

Product stability	Stable
Possible dangerous reactions	Not identified
Possible decomposition agents (other than carbon monoxide,	None

carbon dioxide and water)

Section 11: Toxicological information

Acute toxicity	Product assumed non toxic
Local effects	Possible irritation of mucous membrane

Section 12: Ecological information

There are no known effects to the behavior and evolution of the product with respect to the environment..
The product has no know effects on the environment and is stable and non polluting.

Section 13: Considerations concerning disposal

Recommended disposal methods	Dispose of in a suitable place complying with local regulations. Do not incinerate, as this may cause fiber to be disbursed into the air threatening electrical equipment.

Section 14: Information regarding transport

Codes and classifications of international regulations	None
Specific transport conditions	None

Section 15: Regulatory information

Warnings related to danger and safety	N/A

Section 16:Additional information

We believe the information contained in this safety data sheet to be correct to the best of our knowledge. However, the information contained in this sheet is not exhaustive. This safety sheet does not anticipate all the circumstances in which the product may be used, nor all the physical and mental characteristics of each individual responsible for its transportation or transformation. It is the

duty of the user to test and use this product safely, in accordance with the laws and regulations in force. Unless otherwise stated in writing, we accept no responsibility for complaints or damage caused related to the use of this product. For additional information, please contact Devold AMT AS.

BOSTIK FINDLEY

HAZARD RATINGS HMIS
Health 1
Flammability 1
Reactivity 0
PPE

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product **V048740**

MSDS Name NEV-SZ REG NS160 1

CAS # Mixture

Generic Description Miscellaneous

Manufacturer
BOSTIK FINDLEY, INC.
211 Boston Street
Middleton , MA 01949 USA

24 Hour Emergency Assistance
Phone: 1-800-227-0332

General Assistance
Phone: 1-978-777-0100

MSDS Assistance
Phone: 1-978-777-0100

2 COMPOSITION / INFORMATION ON INGREDIENTS

Component	CAS Number	Percentage
Graphite	7782-42-5	10 - 30
Copper Powder	7440-50-8	5 - 10
Zinc Oxide	1314-13-2	1 - 3
Aluminum Powder	7429-90-5	1 - 3
Non-hazardous and other ingredients below reportable levels	Proprietary	Balance

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Extended contact with this material may cause irritation to the skin, eyes, and mucous membranes. Primary Routes of Exposure: eyes, skin, and inhalation. Irritating fumes and gases may be released upon thermal processing or during combustion.

POTENTIAL HEALTH EFFECTS

SKIN CONTACT: This product may cause irritation to the skin. Prolonged and/or repeated skin contact with this product may cause irritation/dermatitis.

EYE CONTACT: This product may cause irritation to the eyes.

INHALATION: Fumes released during thermal processing may irritate respiratory system, skin and eyes.

INGESTION: Ingestion may cause gastrointestinal tract discomfort or damage.

TARGET ORGANS

Skin.

4 FIRST AID MEASURES

SKIN

For minor exposures, wash thoroughly with soap and clean water. In situations involving considerable skin contact, place the contaminated person in a deluge shower for at least 15 minutes. Remove contaminated clothing to prevent further skin exposure and dispose of properly. Get medical attention if irritation persists.

EYE

Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

INHALATION

Move person to non-contaminated air. If the affected person is not breathing, apply artificial respiration. Seek medical attention.

INGESTION

Do not induce vomiting. If person is conscious and can swallow, immediately give two glasses of water. Seek immediate medical attention. Do not give anything by month to an unconscious or convulsing person.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Dermatitis.

NOTES TO PHYSICIAN

Treat symptomatically and supportively. Contact Bostik Findley to determine whether any additional information is available.

5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Use dry chemical, carbon dioxide, or foam. Water spray (fog).

DUST EXPLOSION HAZARD

None Known

SENSITIVITY TO MECHANICAL IMPACT

None Known

SENSITIVITY TO STATIC DISCHARGE

None Known

UNUSUAL FIRE & EXPLOSION HAZARDS

Product may burn and produce toxic gases in a fire.

FIRE FIGHTING EQUIPMENT/INSTRUCTIONS

Firefighters should wear full protective clothing including self contained breathing apparatus.

Flash Point > 482 F (> 250 C)

6 ACCIDENTAL RELEASE MEASURES

EMERGENCY ACTION

Appropriate safety measures and protective equipment should be used. See Section 8. Do not discharge to lakes, streams, ponds, or sewers. Dispose of in compliance with local, state, and federal regulations.

SPILL OR LEAK PROCEDURE

Scrape up grease and deposit into appropriate containers for disposal.

CLEAN-UP PROCEDURES

Scrape up the spilled material. Deposit into appropriate containers for disposal. Follow the guidelines of 29CFR 1910.120 for dealing with a spill of any size. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill, including the material spilled, the quantity of the spill and the area in which the spill occurred. Wear appropriate protective equipment and clothing during clean-up.

7 HANDLING & STORAGE

STORAGE

Keep the container tightly closed and in a cool, well-ventilated place.

EMPTY CONTAINER PRECAUTION

Attention Follow label warnings even after container is emptied since empty containers may retain product residues. Do not reuse empty container without professional cleaning for food, clothing, or products for human or animal consumption, or where skin contact can occur.

8 E POSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation is not normally required.

EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear safety glasses with side shields.

SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Wear protective impervious gloves to minimize skin exposure. Work clothing sufficient to prevent all skin contact should be worn, such as coveralls and long sleeves.

RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Not normally needed.

EXPOSURE LIMITS

ACGIH - Occupational Exposure Limits - 8 Hour TWAs

COPPER	7440-50-8	0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dusts and mists, as Cu)
ZINC O IDE	1314-13-2	5 mg/m3 TWA (fume); 10 mg/m3 TWA (dust)

OSHA - Vacated PELs - Time Weighted Averages

COPPER	7440-50-8	0.1 mg/m3 TWA (fume, dusts, mists as Cu)
ZINC O IDE	1314-13-2	5 mg/m3 TWA (fume); 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)

9 PHYSICAL & CHEMICAL PROPERTIES

Solubility In Water	0.1 %
Target Solids	100 %
Density	1.21 g/cc
Odor Threshold	NA
Octanol/Water Coefficient	NA
Odor	GREASELIKE
Color	SILVERY GRAY
Physical State	Paste
Freeze Protect	No

10 STABILITY & REACTIVITY

STABILITY/INCOMPATABILITY

Stable under normal conditions.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

If product is burned hazardous gases such as oxides of carbon and nitrogen and various hydrocarbons may be produced.

HAZARDOUS POLYMERIZATION

Will not occur.

CONDITIONS TO AVOID

Avoid contact with Strong Oxidizers and Strong Acids.

11 TO ICOLOGICAL INFORMATION

LD50

NIOSH - Selected LD50s and LC50s

ZINC O IDE	1314-13-2	Inhalation LC50 Mouse: 2500 mg/m3; Oral LD50 Mouse: 7950 mg/kg

CHRONIC EFFECTS

Chronic overexposure to the hazardous materials in this product has been associated with dermatitis.

12 ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available for this product.

13 DISPOSAL CONSIDERATIONS

We make no guarantee or warranty of any kind that the use or disposal of this product complies with all local, state, or federal laws. It is also the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable statutes.

WASTE DISPOSAL

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations. Be aware that State and Local requirements may differ widely depending on location and may in many cases be different from Federal rules.

14 TRANSPORT INFORMATION

COMMENTS

This product is not regulated as a hazardous material by the United States (DOT) or Canadian (TDG) transportation regulations. This product is regulated under IMDG Classification for Ocean Transport as an environmentally hazardous substance, liquid, n.o.s. (contains copper metal powder), class 9, UN3082, PG III, Marine Pollutant.

Proper Shipping Name	Non-Regulated
DOT Restrictions	Not Applicable

15 REGULATORY INFORMATION

This MSDS is prepared and distributed pursuant to the Federal Hazard Communication Standard, 29 CFR 1910.1200.

FEDERAL REGULATIONS

All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA - Hazardous Substances and their Reportable Quantities

COPPER	7440-50-8	final RQ = 5000 pounds (2270 kg) (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 0.004 inches)
ZINC O IDE	1314-13-2	statutory RQ = 1 pound (0.454 kg)

Based on an evaluation of the components used, this product does contain hazardous ingredients identified as per 29 CFR 1910.1200.

STATE REGULATIONS

If this product contains any ingredients listed under California Proposition 65, they will be noted below:

INTERNATIONAL REGULATIONS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and contains all the information required by the Controlled Products Regulations.

This is a "controlled product" under the Canadian Workplace Hazardous Materials Information System (WHMIS). Class D Division 2 Sub-division B.

SARA 302 EXTREMELY HAZARDOUS SUBSTANCES

Not Regulated

SARA 311/312 HAZARD CATEGORIES

Immediate Hazard	No
Delayed Hazard	No
Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	No

SARA 313 TOXIC CHEMICALS

Component	CAS Number	Percentage
Copper Powder	7440-50-8	5 - 10
Zinc Oxide	1314-13-2	1 - 3
Aluminum Powder	7429-90-5	1 - 3

16 OTHER INFORMATION

DISCLAIMER

The data in this MSDS has been compiled from publicly available sources. This data relates only to the designated product and not to the use of said product in combination with other materials. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Responsibility for proper precautions and safe use of the product lies with the user. All data in this MSDS is typical of the product as a whole, and does not represent any individual lot or batch, therefore, Bostik Findley, Inc. makes no warranty about the accuracy of the data herein and assumes no liability for the use of such data. It is the responsibility of the user to comply with all applicable federal, state, and local laws and regulations.

Issue Date 10-Jul-2002 **Supercedes** 06-Nov-2001

Prepared By Russell Hardenber

MSDS Sections Reviewed and/or Updated

Composition / Information on Ingredients: COMPOSITION COMMENTS

Composition / Information on Ingredients: CONDITIONAL DEFAULT STATEMENTS

*** BÜFA®-Bonding Paste 0588** Date revised: 30.05.2015

7400588 Version: 8 / EU Master No. M-401 Print date: 13.01.16

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name

BÜFA®-Bonding Paste 0588

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture

Purpose of use: Raw substance formulas for manufacturing shaped parts from unsaturated polyester / vinyl ester resins.

1.3. Details of the supplier of the safety data sheet

Address

BÜFA Composite Systems
GmbH & Co. KG
Hohe Looge 2-8
26180 Rastede

Telephone no.	+49 4402 975-0
Fax no.	+49 4402 975-400
Information provided by / telephone	Department product safety / +49 4402 975-415
E-Mail	produktsicherheit-compositesystems@buefa.de

1.4. Emergency telephone number

Giftzentrale Goettingen: +49 551 19240

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (Regulation (EC) No. 1272/2008)

Flam. Liq. 3	H226	
Skin Irrit. 2	H315	
Eye Irrit. 2	H319	
Repr. 2	H361d	
STOT SE 3	H335	
STOT RE 1	H372	Organs: Ear; Route of exposure: inhalative

The product is classified and labelled in accordance with Regulation (EC) No 1272/2008
For explanation of abbreviations see section 16.

2.2. Label elements

Labelling according to regulation (EC) No 1272/2008

Hazard pictograms

Signal word

Danger

Hazard statements

H226	Flammable liquid and vapour.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H361d	Suspected of damaging the unborn child.
H335	May cause respiratory irritation.

H372	Causes damage to organs through prolonged or repeated exposure: Ear; Route of exposure: inhalative

Precautionary statements

P210.9	Keep away from sparks, open flames and other ignition sources. No smoking.
P260.8	Do not breathe vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/attention.

Hazardous component(s) to be indicated on label (Regulation (EC) No. 1272/2008)

contains Styrene

2.3. Other hazards

The product does not contain PBT/vPvB-substances.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Hazardous ingredients

Styrene

CAS No.	100-42-5				
EINECS no.	202-851-5				
Registration no.	01-2119457861-32-XXXX				
Concentration	>=	29	<	50	%

Flam. Liq. 3	H226	
Skin Irrit. 2	H315	
Acute Tox. 4	H332	
Eye Irrit. 2	H319	
STOT SE 3	H335	
STOT RE 1	H372	Organs: Ear; Route of exposure: inhalative
Asp. Tox. 1	H304	
Repr. 2	H361d	

Complete text of hazard statements in chapter 16

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

Adhere to personal protective measures when giving first aid. Remove soiled or soaked clothing immediately, do not allow to dry.

After inhalation

Remove the casualty into fresh air and keep him calm. Irregular breathing/no breathing: artificial respiration. In the event of symptoms take medical treatment.

After skin contact

Wash off immediately with soap and water.

After eye contact

In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Seek medical advice immediately. Remove contact lenses

After ingestion

Rinse mouth thoroughly with water. Summon a doctor immediately. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. If individual is drowsy or unconscious place in recovery position (on left side, with head down).

4.2. Most important symptoms and effects, both acute and delayed

The following symptoms may occur: Headache, Dizziness, Nausea

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Alcohol-resistant foam, Dry powder, Carbon dioxide

Non suitable extinguishing media

Full water jet

5.2. Special hazards arising from the substance or mixture

In case of combustion evolution of dangerous gases possible. In the event of fire the following can be released: Carbon monoxide (CO); Nitrogen oxides (NOx); dense black smoke

5.3. Advice for firefighters

Use self-contained breathing apparatus.

Collect contaminated fire-fighting water separately, must not be discharged into the drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid contact with skin, eyes and clothing. Use personal protective clothing. Keep away sources of ignition. Ensure adequate ventilation. Use breathing apparatus if exposed to vapours/dust/aerosol.

6.2. Environmental precautions

Do not allow to enter drains or waterways. Do not discharge into the subsoil/soil. Prevent spread over a wide area (e.g. by containment or oil barriers).

6.3. Methods and material for containment and cleaning up

Pick up with absorbent material (eg sand, kieselgur, acid binder, universal binder, sawdust). When picked up, treat material as prescribed under Section 13 "Disposal".

6.4. Reference to other sections

Information regarding Safe handling, see Section 7. Information regarding personal protective measures, see Section 8. Information regarding waste disposal, see Section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Provide good ventilation of working area (local exhaust ventilation if necessary). Observe the usual precautions for handling chemicals.

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharge. Vapours can form an explosive mixture with air.

7.2. Conditions for safe storage, including any incompatibilities

Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Keep container tightly closed and dry in a cool, well-ventilated place. Protect from heat and direct sunlight.

7.3. Specific end use(s)

No information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Derived No/Minimal Effect Levels (DNEL/DMEL)

Styrene

Reference substance	Styrene			
DNEL				
Conditions	Worker	Acute	inhalative	Systemic effects
Concentration	289	mg/m³		
DNEL				
Conditions	Worker	Long term	inhalative	Systemic effects
Concentration	85	mg/m³		
DNEL				
Conditions	Worker	Acute	inhalative	Local effects
Concentration	306	mg/m³		
DNEL				
Conditions	Worker	Long term	dermal	Systemic effects
Concentration	406	mg/kg/d		

8.2. Exposure controls

Appropriate engineering controls

Use only in well ventilated areas.
Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommendedor statutory limits.

General protective and hygiene measures

Provide good ventilation of working area (local exhaust ventilation if necessary). Avoid contact with skin and eyes. Do not inhale gases/vapours/aerosols.

Respiratory protection

If workplace limits are exceeded, a respiratory protection approved for this particular job must be worn.
Short term: filter apparatus, Filter A

Hand protection

Chemical resistant gloves

Appropriate Material	Butyl rubber		
Material thickness		0,7	mm
Breakthrough time	=	30	min

Eye protection

Tightly fitting safety glasses

Body protection

Clothing as usual in the chemical industry.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Pasty		
Colour	grey		
Odour	of styrene		
Flash point			
Value		32	°C
Efflux time			
Value	>	61	s
Method	DIN EN ISO 2431 - 6 mm		
Density			
Value		1,25	g/cm³

Temperature	20	°C

9.2. Other information

No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No hazardous reactions when stored and handled according to prescribed instructions.

10.2. Chemical stability

The product is stable.

10.3. Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4. Conditions to avoid

Protect from heat and direct sunlight.

10.5. Incompatible materials

Reactions with peroxides and other radical components.

10.6. Hazardous decomposition products

No hazardous decomposition products known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute oral toxicity

Based on available data, the classification criteria are not met.

Acute oral toxicity (Components)

Styrene

Species	rat		
LD50	>	5000	mg/kg

Acute dermal toxicity

Based on available data, the classification criteria are not met.

Acute dermal toxicity (Components)

Styrene

Species	rat		
LD50	>	5000	mg/kg

Acute inhalational toxicity

ATE		39,5	mg/l
Administration/Form	Vapors		
Method	calculated value (Regulation (EC) No. 1272/2008)		
ATE		5,02	mg/l
Administration/Form	Dust/Mist		
Method	calculated value (Regulation (EC) No. 1272/2008)		

Acute inhalative toxicity (Components)

Styrene

Species	rat		
LC50		11,8	mg/l
Duration of exposure		4 h	
Administration/Form	Vapors		

Skin corrosion/irritation

evaluation	irritant

Serious eye damage/irritation

evaluation irritant

Sensitization (Components)

Styrene

evaluation non-sensitizing

Mutagenicity

Based on available data, the classification criteria are not met.

Carcinogenicity

Based on available data, the classification criteria are not met.

Reproductive toxicity

evaluation Suspected of damaging the unborn child.

Specific Target Organ Toxicity (STOT)

evaluation May cause damage to organs.
Route of exposure inhalative
Organs: Ear

Other information

Inhalation of the vapours causes irritation of the respiratory tract and mucous membrane, headaches, nausea, giddiners, vomiting.

SECTION 12: Ecological information

12.1. Toxicity

Fish toxicity

Styrene

LC/EC/IC50	>	1,0	to	10	mg/l

Daphnia toxicity

Styrene

Species	Daphnia magna				
LC/EC/IC50	>	1,0	to	10	mg/l

Algae toxicity

Styrene

LC/EC/IC50	>	1,0	to	10	mg/l

Bacteria toxicity

No toxicological data are available.

12.2. Persistence and degradability

For this subsection there is no ecotoxicological data available on the product as such.

Biodegradability

Styrene

evaluation Readily biodegradable (according to OECD criteria)

12.3. Bioaccumulative potential

For this subsection there is no ecotoxicological data available on the product as such.

12.4. Mobility in soil

For this subsection there is no ecotoxicological data available on the product as such.

12.5. Results of PBT and vPvB assessment

The product does not contain PBT/vPvB-substances.

12.6. Other adverse effects

For this subsection there is no ecotoxicological data available on the product as such.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal recommendations for the product

EWC waste code 07 02 08* other still bottoms and reaction residues

The listed waste code numbers, according to the European Waste Catalogue (EWC), are to be understood as a recommendation. A final decision must be made in agreement with the regional waste disposal company.

Disposal recommendations for packaging

Packaging that cannot be cleaned should be disposed off as product waste.

SECTION 14: Transport information

Land transport ADR/RID

14.1. UN number

UN number 1866

14.2. UN proper shipping name

RESIN SOLUTION

14.3. Transport hazard class(es)

Class	3

14.4. Packing group

Packing group	III
Special provision	640E
Remarks	Viscous product: Transport according to paragraph 2.2.3.1.5 ADR/RID
Tunnel restriction code	D/E

Marine transport IMDG/GGVSee

14.1. UN number

UN number 1866

14.2. UN proper shipping name

RESIN SOLUTION

14.3. Transport hazard class(es)

Class	3

14.4. Packing group

Packing group	III
Remarks	Transport according to 2.3.2.5 of the IMDG Code
EmS	F-E, S-E

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

VOC

VOC (EU) 0,22 %

Other information

The product does not contain substances of very high concern (SVHC).

MAL-Code 5-6

15.2. Chemical safety assessment

No information available

SECTION 16: Other information

Hazard statements listed in Chapter 3

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.

H335	May cause respiratory irritation.
H361d	Suspected of damaging the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure:

Abbreviations

CAS: Chemical Abstracts Service
EAK: Europäischer Abfallkatalog
EINECS: European Inventory of Existing Commercial Chemical Substances
PBT: Persistent, Bioaccumulative and Toxic
vPvB: Very persistent and very bioaccumulative
VOC: Volatile Organic Compound

CLP categories listed in Chapter 3

Acute Tox. 4	Acute toxicity, Category 4
Asp. Tox. 1	Aspiration hazard, Category 1
Eye Irrit. 2	Eye irritation, Category 2
Flam. Liq. 3	Flammable liquid, Category 3
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin irritation, Category 2
STOT RE 1	Specific target organ toxicity - repeated exposure, Category 1
STOT SE 3	Specific target organ toxicity - single exposure, Category 3

Supplemental information

Relevant changes compared with the previous version of the safety data sheet are marked with: ***
This information is based on our present state of knowledge. However, it should not constitute a guarantee for any specific product properties and shall not establish a legally valid relationship.

HEALTH AND SAFETY DATA SHEET

OPTIMAT CARBON VEIL

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT : **OPTIMAT CARBON VEIL**

COMPANY : PRF Composite Materials
3 Upton Road
Poole
Dorset
BH17 7AA

TELEPHONE : 01202 680022

FAX : 01202 680077

Out of hours : 07785 501851

2. HAZARDS IDENTIFICATION

Cutting through the material and surface scuffing may release small amounts of airborne carbon fibres and dust which are mechanical irritants to skin, eyes and upper respiratory system.

As with any airborne dust, pre-existing upper respiratory and lung diseases may be aggravated.

Cutting through the material or mechanical processing may create small amounts of respirable fibre particulates of carbon.

Airborne Carbon fibres or dust may result in shorts and malfunction of electrical equipment.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Constitution:

	% By Weight	CAS / EINECS No
Pitch or PAN based Carbon Fibre	75 - 97	7440-44-0 / 231-153-3
Polymeric binder	3.0 – 25	N/A

HEALTH AND SAFETY DATA SHEET
OPTIMAT CARBON VEIL

4. FIRST AID MEASURES

SKIN	Rinse affected areas with water and wash gently with soap. Do not use detergent.
EYES	Flush eyes with large quantities of water. Have eye bath readily available in areas where eye contact may occur. Seek medical attention if irritation continues.
INGESTION	Drink plenty of water. Seek medical advice if symptoms persist.
INHALATION	Remove to fresh air, drink water and clear throat and blow nose to evacuate fibre/dust. Seek medical attention.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media:

Use extinguishing agent suitable for type of surrounding combustible materials.

Unusual Fire & Explosion Hazards:

Incineration of product may result in release of airborne Carbon fibres leading to shorts in electrical equipment.

6. ACCIDENTAL RELEASE MEASURES

Do not allow dust or fibres to be wind blown.
Unwanted product should be collected and stored in sealed bags.

Do not use compressed air to remove dust or fibres from clothing or equipment

Dust or fibre deposits should be collected using a suitable vacuum cleaner with HEPA exhaust air filtration. The collected deposits and used vacuum bags should be sealed into poly bags before disposal.

If sweeping is required the area should be thoroughly damped down with water before sweeping commences to prevent dust or fibre becoming airborne during sweeping.

7. HANDLING AND STORAGE

Handling: Keep dust generation to a minimum.

Storage: Store dry and cool. Keep in original wrapping until required for use.

HEALTH AND SAFETY DATA SHEET
OPTIMAT CARBON VEIL

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Applicable Occupational Exposure Limits: from HSE EH40 / 2005 and Supplement Oct 2007:

Fine Carbon Dust: 3.5 mg/m^3(8 hr TWA) and 7 mg/m^3 (STEL)

Respiratory Protection: Use local exhaust ventilation (extraction) where available to maintain airborne carbon dust levels below the occupational exposure limit. If airborne carbon dust levels exceed the occupational exposure limit wear disposable dust masks to EN149:2001 - FFP2minimum.

Hand Protection: The use of disposable vinyl gloves is recommended.

Eye Protection: Wear goggles or safety glasses with side shields.

Skin Protection: Wear overalls that are loose fitting at the neck and wrists.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Black Tissue, veil or mat.

Density: 60 -110 kg/m$_3$

Flammability: The material will burn for a short period until the polymeric binder is burnt out.

10. STABILITY AND REACTIVITY

Stability/Conditions to avoid: Stable

Materials to avoid: Strong oxidising agents.

Hazardous decomposition products: Combustion products are H_2O, CO_2 CO_2 and hydrocarbons.

Hazardous Polymerisation: Will not occur.

11. TOXICOLOGICAL INFORMATION

Carbon fibre is non-toxic

Skin contact with carbon fibres or dust produced by cutting or mechanical processing of the product may cause temporary irritation to the eyes skin and respiratory system due to mechanical effects.

Prolonged or repeated skin contact may result in mechanical dermatitis

The carbon fibres have mean diameters > 6.0 μm and are not classified as respirable fibres; the fibres do not fibrillate during mechanical processing.

Cutting or mechanical processing of the products may create small amounts of respirable fibre particulates of carbon.

HEALTH AND SAFETY DATA SHEET
OPTIMAT CARBON VEIL

12. ECOLOGICAL INFORMATION

The fibre content will remain inert.

The polymeric binder may bio-degrade releasing the carbon fibres

13. DISPOSAL CONSIDERATIONS

Waste is not classified as a hazardous waste and may be disposed of at a normal licensed industrial waste site. Local regulations should be considered.

Waste should be bagged or suitably contained for disposal to prevent any dusts being wind blown during disposal.

Incineration of waste should only be done in incinerators fitted with exhaust gas filtration or scrubbers to prevent the release of airborne fibres and dust

14. TRANSPORT INFORMATION

Not regulated for Transport.

Ensure that dust is not wind blown during transportation

15. REGULATORY INFORMATION

These products are not subject to regulation

16. OTHER INFORMATION

Notes: Revised January 2009

Sections 2 - Hazards Info ; note added regarding respirable fibre particulates

Section 11 - Toxicology note added regarding respirable fibre particulates of carbon

Plus minor changes

This information only concerns the above named product(s) and may not be valid if used with other product(s) or in any process. This information is, to our best knowledge, correct and complete, but no guarantee can be given. It remains the responsibility of the user to make sure that the information is appropriate and complete for their particular use of the product.
If you have purchased this product for supply to a third party for use at work, it is your duty to take all necessary steps to ensure that any person handling or using the product is provided with the information on this sheet.
If you are an employer, it is your duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions which should be taken.

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name	**Optipit**
Product code	453841-DE03
SDS no.	453841
Historic SDS no.	66400-AG
Product type	Grease

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses
General use of lubricants and greases in vehicles or machinery-Industrial General use of lubricants and greases in vehicles or machinery-Professional

Use of the substance/ mixture	Grease for industrial applications. For specific application advice see appropriate Technical Data Sheet or consult our company representative.

1.3 Details of the supplier of the safety data sheet

Supplier	BP Europa SE Geschäftsbereich Industrieschmierstoffe Erkelenzer Straße 20 D-41179 Mönchengladbach Germany Telefon: +49 (0)2161 909-30 Telefax: +49 (0)2161 909-392
E-mail address	MSDSadvice@bp.com

1.4 Emergency telephone number

EMERGENCY TELEPHONE NUMBER	Carechem: +44 (0) 1235 239 670 (24 hours)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition Mixture

Classification according to Directive 1999/45/EC [DPD]

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification	R43 R52/53
Human health hazards	May cause sensitisation by skin contact.
Environmental hazards	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

See Section 16 for the full text of the R phrases or H statements declared above.

See sections 11 and 12 for more detailed information on health effects and symptoms and environmental hazards.

2.2 Label elements

Hazard symbol or symbols

Indication of danger Irritant

Risk phrases R43- May cause sensitisation by skin contact.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SECTION 2: Hazards identification

Safety phrases
S28- After contact with skin, wash immediately with plenty of soap and water.
S36/37/39- Wear suitable protective clothing, gloves and eye/face protection.
S61- Avoid release to the environment. Refer to special instructions/safety data sheet.

Hazardous ingredients
Reaction product of ammonium molybdate and C12-C24-diethoxylated alkylamine (1:5-1:3)

Supplemental label elements
Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings
Not applicable.

Tactile warning of danger
Not applicable.

2.3 Other hazards

Other hazards which do not result in classification
Defatting to the skin.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency.
See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

SECTION 3: Composition/information on ingredients

Substance/mixture
Mixture

Highly refined mineral oil and additives. Thickening agent.

Product/ingredient name	Identifiers	%	Classification 67/548/EEC	Classification Regulation (EC) No. 1272/2008 [CLP]	Type
Fatty acids, vegetable-oil, Me esters, sulfurized	EC: 276-337-4 CAS: 72102-30-8	>=0.25 - <2.5	N; R51/53	Aquatic Chronic 2, H411	[1]
Reaction product of ammonium molybdate and C12-C24-diethoxylated alkylamine (1:5-1:3)	REACH #: 01-0000016000-92 EC: 412-780-3 Index: 042-004-00-5	>=1 - <2.5	Xi; R38 R43 N; R51/53	Skin Irrit. 2, H315 Skin Sens. 1, H317 Aquatic Chronic 2, H411	[1]
Phosphorous acid, decyl diphenyl ester.	EC: 247-777-4 CAS: 26544-23-0	>=0.25 - <1	Xi; R38 R43 N; R51/53	Skin Irrit. 2, H315 Skin Sens. 1, H317 Aquatic Chronic 2, H411	[1]
zinc bis[O-(2-ethylhexyl)] bis[O-(isobutyl)] bis (dithiophosphate)	EC: 247-810-2 CAS: 26566-95-0	>=0.25 - <1	Xi; R41 N; R51/53	Eye Dam. 1, H318 Aquatic Chronic 2, H411	[1]

See Section 16 for the full text of the R-phrases declared above.

See Section 16 for the full text of the H statements declared above.

Type
[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
[5] Substance of equivalent concern

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Skin contact
Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. In the event of any complaints or symptoms, avoid further exposure. Get medical attention.

Inhalation
If inhaled, remove to fresh air. Get medical attention if symptoms appear. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

SECTION 4: First aid measures

Ingestion

Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Get medical attention if symptoms occur.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

In case of inhalation of decomposition products in a fire, symptoms may be delayed.
The exposed person may need to be kept under medical surveillance for 48 hours.
Treatment should in general be symptomatic and directed to relieving any effects.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In case of fire, use water fog, alcohol resistant foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media

Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture

In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products

Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)
metal oxide/oxides
nitrogen oxides (NO, NO_2 etc.)
sulphur oxides (SO, SO_2, etc.)

5.3 Advice for firefighters

Special precautions for fire-fighters

Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. This material is harmful to aquatic organisms.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Floors may be slippery; use care to avoid falling. Do not breathe vapour or mist. Ensure good ventilation. Put on appropriate personal protective equipment.

For emergency responders

Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus. Wear a suitable chemical protective suit. Chemical resistant boots. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material.

SECTION 6: Accidental release measures

6.3 Methods and materials for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Use a tool to scoop up solid or absorbed material and place into appropriate labelled waste container.

Large spill

Immediately contact emergency personnel. Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilt product. If emergency personnel are unavailable, contain spilt material. Suction or scoop the spill into appropriate disposal or recycling vessels, then cover spill area with oil absorbent. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 5 for firefighting measures.
See Section 8 for information on appropriate personal protective equipment.
See Section 12 for environmental precautions.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapour or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Empty containers retain product residue and can be hazardous.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store and use only in equipment/containers designed for use with this product. Keep away from heat and direct sunlight. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10).

Germany - Storage code

11

7.3 Specific end use(s)

Recommendations

See section 1.2 and Exposure scenarios in annex, if applicable.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived No Effect Level

No DNELs/DMELs available.

SECTION 8: Exposure controls/personal protection

Predicted No Effect Concentration

No PNECs available

8.2 Exposure controls

Appropriate engineering controls

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective occupational exposure limits.
All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection

Respiratory protective equipment is not normally required where there is adequate natural or local exhaust ventilation to control exposure.
In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

General Information:

Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. The correct choice of protective gloves depends upon the chemicals being handled, and the conditions of work and use. Most gloves provide protection for only a limited time before they must be discarded and replaced (even the best chemically resistant gloves will break down after repeated chemical exposures).

Gloves should be chosen in consultation with the supplier / manufacturer and taking account of a full assessment of the working conditions.

Recommended: Nitrile gloves.
Breakthrough time:

Breakthrough time data are generated by glove manufacturers under laboratory test conditions and represent how long a glove can be expected to provide effective permeation resistance. It is important when following breakthrough time recommendations that actual workplace conditions are taken into account. Always consult with your glove supplier for up-to-date technical information on breakthrough times for the recommended glove type.
Our recommendations on the selection of gloves are as follows:

Continuous contact:

Gloves with a minimum breakthrough time of 240 minutes, or >480 minutes if suitable gloves can be obtained.
If suitable gloves are not available to offer that level of protection, gloves with shorter breakthrough times may be acceptable as long as appropriate glove maintenance and replacement regimes are determined and adhered to.

Short-term / splash protection:

Recommended breakthrough times as above.
It is recognised that for short-term, transient exposures, gloves with shorter breakthrough times may commonly be used. Therefore, appropriate maintenance and replacement regimes must be determined and rigorously followed.

Glove Thickness:

SECTION 8: Exposure controls/personal protection

For general applications, we recommend gloves with a thickness typically greater than 0.35 mm.

It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.
Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task.

Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:

• Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.

• Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential.

Skin and body

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	
Physical state	Grease
Colour	Clear Brown. [Dark]
Odour	Mild
Odour threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Drop Point	>250 °C
Flash point	Closed cup: >150°C (>302°F) [Based on Lubricants - Base Oils]
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Relative density	Not available.
Density	<1000 kg/m³ (<1 g/cm³) at 20°C
Solubility(ies)	insoluble in water.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.

SECTION 9: Physical and chemical properties

Explosive properties Not available.

Oxidising properties Not available.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.

10.2 Chemical stability The product is stable.

10.3 Possibility of hazardous reactions Under normal conditions of storage and use, hazardous polymerisation will not occur. Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid Avoid all possible sources of ignition (spark or flame).

10.5 Incompatible materials Reactive or incompatible with the following materials: oxidising materials.

10.6 Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on the likely routes of exposure Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Inhalation Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion No known significant effects or critical hazards.

Skin contact May cause skin dryness and irritation. May cause sensitisation by skin contact.

Eye contact No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation No specific data.

Ingestion No specific data.

Skin contact Adverse symptoms may include the following:
irritation
redness
dryness
cracking

Eye contact No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Inhalation Inhalation of oil mist or vapours at elevated temperatures may cause respiratory irritation.

Ingestion Ingestion of large quantities may cause nausea and diarrhoea.

Skin contact Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

Eye contact Potential risk of transient stinging or redness if accidental eye contact occurs.

Potential chronic health effects

General Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Environmental hazards Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

Not available.

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) Not available.

Mobility Non-volatile. Grease. insoluble in water.

12.5 Results of PBT and vPvB assessment

PBT Not applicable.

vPvB Not applicable.

12.6 Other adverse effects No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

Methods of disposal The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Hazardous waste Yes.

European waste catalogue (EWC)

Waste code	Waste designation
12 01 12*	spent waxes and fats

However, deviation from the intended use and/or the presence of any potential contaminants may require an alternative waste disposal code to be assigned by the end user.

Packaging

Methods of disposal Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations. Recycle, if possible.

Waste code	European waste catalogue (EWC)
15 01 10*	packaging containing residues of or contaminated by dangerous substances

Special precautions This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Empty containers represent a fire hazard as they may contain flammable product residues and vapour. Never weld, solder or braze empty containers. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-

SECTION 14: Transport information

14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

14.6 Special precautions for user Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Not applicable.

Other regulations

REACH Status The company, as identified in Section 1, sells this product in the EU in compliance with the current requirements of REACH.

United States inventory (TSCA 8b) All components are listed or exempted.

Australia inventory (AICS) All components are listed or exempted.

Canada inventory At least one component is not listed.

China inventory (IECSC) All components are listed or exempted.

Japan inventory (ENCS) At least one component is not listed.

Korea inventory (KECI) All components are listed or exempted.

Philippines inventory (PICCS) At least one component is not listed.

National regulations

Hazard class for water 2 Appendix No. 4 (classified according VwVwS)

15.2 Chemical Safety Assessment This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Abbreviations and acronyms

ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS = Chemical Abstracts Service
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
CSA = Chemical Safety Assessment
CSR = Chemical Safety Report
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DPD = Dangerous Preparations Directive [1999/45/EC]

SECTION 16: Other information

DSD = Dangerous Substances Directive [67/548/EEC]
EINECS = European Inventory of Existing Commercial chemical Substances
ES = Exposure Scenario
EUH statement = CLP-specific Hazard statement
EWC = European Waste Catalogue
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
OECD = Organisation for Economic Co-operation and Development
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SADT = Self-Accelerating Decomposition Temperature
SVHC = Substances of Very High Concern
STOT-RE = Specific Target Organ Toxicity - Repeated Exposure
STOT-SE = Specific Target Organ Toxicity - Single Exposure
TWA = Time weighted average
UN = United Nations
UVCB = Complex hydrocarbon substance
VOC = Volatile Organic Compound
vPvB = Very Persistent and Very Bioaccumulative

Full text of abbreviated H statements

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H411	Toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

Aquatic Chronic 2, H411	LONG-TERM AQUATIC HAZARD - Category 2
Eye Dam. 1, H318	SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
Skin Irrit. 2, H315	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1, H317	SKIN SENSITIZATION - Category 1

Full text of abbreviated R phrases

R41- Risk of serious damage to eyes.
R38- Irritating to skin.
R43- May cause sensitisation by skin contact.
R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Full text of classifications [DSD/DPD]

Xi - Irritant
N - Dangerous for the environment

History

Date of issue/ Date of revision 14/11/2013.

Date of previous issue 11/11/2013.

Prepared by Product Stewardship

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

Annex to the extended Safety Data Sheet (eSDS)

Industrial

Identification of the substance or mixture

Product definition	Mixture
Code	453841-DE03
Product name	Optipit

Section 1:: Title

Short title of the exposure scenario	General use of lubricants and greases in vehicles or machinery - Industrial - B-B6.4 (i)
List of use descriptors	**Identified use name:** General use of lubricants and greases in vehicles or machinery-Industrial **Process Category:** PROC01, PROC02, PROC08b, PROC09 **Sector of end use:** SU03 **Subsequent service life relevant for that use:** No. **Environmental Release Category:** ERC04, ERC07 **Specific Environmental Release Category:** ATIEL-ATC SPERC 4.Biv1
Processes and activities covered by the exposure scenario	Covers general use of lubricants and greases in vehicles or machinery in closed systems. Includes filling and draining of containers and operation of enclosed machinery (including engines) and associated maintenance and storage activities.

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

Physical state:	Liquid, vapour pressure < 0.5 kPa
Concentration of substance in product:	Covers use of substance/product up to 100 % (unless stated differently)
Frequency and duration of use:	Covers daily exposures up to 8 hours (unless stated differently).
Other given operational conditions affecting workers exposure:	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenarios: Operational conditions and risk management measures

General measures applicable to all activities:
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Avoid direct eye contact with product also via contamination on hands.

General exposures (closed systems):
No other specific measures identified.

Initial factory fill of equipment Use in contained systems:
No other specific measures identified.
Initial factory fill of equipment (open systems):
Provide a good standard of controlled ventilation (10 to 15 air changes per hour). Avoid carrying out operation for more than 4 hours.

Operation of equipment containing engine oils and similar Use in contained systems:
No other specific measures identified.

Equipment cleaning and maintenance:
Drain down system prior to equipment break-in or maintenance. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.

Equipment cleaning and maintenance Operation is carried out at elevated temperature (> 20°C above ambient temperature).:
Drain down and flush system prior to equipment break-in or maintenance. Provide extract ventilation to emission points when contact with warm (>50°C) lubricant is likely. Wear chemical-resistant gloves (tested to EN374) in combination with intensive management supervision controls. Retain drain-downs in sealed storage pending disposal

or for subsequent recycle.

Storage:
Store substance within a closed system.

Section 2.2:: Control of environmental exposure

Amounts used:	
EU tonnage of risk determining substance per year:	2.63E+3 Tonnes/year
Frequency and duration of use:	
Emission Days (days/year):	300
Environment factors not influenced by risk management:	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure:	Negligible wastewater emissions as process operates without water contact.
Release fraction to wastewater from process (after typical onsite RMMs and before sewage treatment plan)	2.00E-11
Technical conditions and measures at process level (source) to prevent release:	Common practices vary across sites thus conservative process release estimates used.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Prevent discharge of undissolved substance to or recover from onsite wastewater. User sites are assumed to be provided with oil/water separators and waste water to be discharged via a sewage treatment plant
Organisational measures to prevent/limit release from site:	Do not apply industrial sludge to natural soils. sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant:	
Estimated substance removal from wastewater via on-site sewage treatment (%):	69.1
Assumed domestic sewage treatment plant flow rate (m3/d)	2.00E+3
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d): as product:	7594049
Conditions and measures related to external treatment of waste for disposal:	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.

Section 3:: Exposure estimation

Exposure estimation and reference to its source - Environment	
Exposure assessment (environment):	Used ECETOC TRA model (May 2010 release).

Exposure estimation and reference to its source - Workers	
Exposure assessment (human):	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Section 4:: Guidance to check compliance with the exposure scenario

Environment	Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures. Further details on scaling and control technologies are provided in SpERC factsheet. If scaling reveals a condition of unsafe use (i.e., RCRs > 1), additional RMMs or a site-specific chemical safety assessment is required. For further information see www.ATIEL.org/REACH_GES
Health	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Professional

Identification of the substance or mixture

Product definition	Mixture
Code	453841-DE03
Product name	Optipit

Section 1:: Title

Short title of the exposure scenario	General use of lubricants and greases in vehicles or machinery - Professional - B-B6.4 (p)
List of use descriptors	**Identified use name:** General use of lubricants and greases in vehicles or machinery-Professional **Process Category:** PROC01, PROC02, PROC08a, PROC08b, PROC20 **Sector of end use:** SU22 **Subsequent service life relevant for that use:** No. **Environmental Release Category:** ERC09a, ERC09b **Specific Environmental Release Category:** ESVOC SpERC 9.6b.v1
Processes and activities covered by the exposure scenario	Covers general use of lubricants and greases in vehicles or machinery in closed systems. Includes filling and draining of containers and operation of enclosed machinery (including engines) and associated maintenance and storage activities.

Section 2: Operational conditions and risk management measures

Section 2.1: Control of worker exposure

Product characteristics:

Physical state:	Liquid, vapour pressure < 0.5 kPa
Concentration of substance in product:	Covers use of substance/product up to 100 % (unless stated differently)
Frequency and duration of use:	Covers daily exposures up to 8 hours (unless stated differently).
Other given operational conditions affecting workers exposure:	Assumes use at not more than 20°C above ambient temperature, unless stated differently. Assumes a good basic standard of occupational hygiene is implemented.

Contributing scenarios: Operational conditions and risk management measures

General measures applicable to all activities:
Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN 374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop. Use suitable eye protection. Avoid direct eye contact with product also via contamination on hands.

Operation of equipment containing engine oils and similar Use in contained systems:
No other specific measures identified.

Material transfers Non-dedicated facility:
Avoid carrying out activities involving exposure for more than 4 hours. Wear chemical-resistant gloves (tested to EN374) in combination with specific activity training.

Equipment cleaning and maintenance Dedicated facility:
Drain down system prior to equipment break-in or maintenance. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.

Storage:
Store substance within a closed system.

Section 2.2:: Control of environmental exposure

Amounts used:	
EU tonnage of risk determining substance per year:	5.39 Tonnes/year
Frequency and duration of use:	
Emission Days (days/year):	365
Environment factors not influenced by risk management:	
Local freshwater dilution factor:	10
Local marine water dilution factor:	100
Other given operational conditions affecting environmental exposure:	Negligible wastewater emissions as process operates without water contact.
Release fraction to wastewater from process (after typical onsite RMMs and before sewage treatment plan)	5.00E-04
Technical conditions and measures at process level (source) to prevent release:	Common practices vary across sites thus conservative process release estimates used.
Technical on-site conditions and measures to reduce or limit discharges, air emissions and releases to soil:	Prevent discharge of undissolved substance to or recover from onsite wastewater.
Organisational measures to prevent/limit release from site:	Do not apply industrial sludge to natural soils. sludge should be incinerated, contained or reclaimed.
Conditions and measures related to municipal sewage treatment plant:	
Estimated substance removal from wastewater via on-site sewage treatment (%):	69.1
Assumed domestic sewage treatment plant flow rate (m3/d)	2.00E+3
Maximum allowable site tonnage (M_{Safe}) based on release following total wastewater treatment removal (kg/d): as product:	19111
Conditions and measures related to external treatment of waste for disposal:	External treatment and disposal of waste should comply with applicable local and/or national regulations.
Conditions and measures related to external recovery of waste:	External recovery and recycling of waste should comply with applicable local and/or national regulations.

Section 3:: Exposure estimation

Exposure estimation and reference to its source - Environment	
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Exposure estimation and reference to its source - Workers	
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Health	Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

AQUA SUPER®

SAFETY SHEET

Drawn out after the Danish Ministry of Employment's order, number 559 by 4. July 2002

1. Identification of the substance/material:

Product name: **Optirens**

Manufacture: **North Clean Technology aps.**
Voddervej 1
DK-6780 Skaerbaek
Tlf: +45 97132382
Email: erri-comfort.dk

Product registration number:-

Use: All-round cleaning product.
Usually used in a mixture of 3-8%.

Date: 03.06.2008

2. Composition/information about content of substances:

Content among others	EINECS/ELINS	CAS-number	Weight-%	Classification
Lutensol GD 70	Pr.nr.99371	-	8-13	Xi;R41

-: Means no data or not relevant. The whole text for R-sentences can be found in point 16.

3. Danger identification:

The product can irritate the eyes.

4. First aid:

Inhaling:

Seek into an area with fresh air. If the malaise does not stop contact a doctor.

Skin contact:

Wash skin in plenty of water and soap. After cleaning smear skin with a thick cream. If irritation does not stop contact Medical doctor or an emergency room.

Eye contact:

Open one's eye wide and wash with plenty of water for at least 15 minutes. If irritation does not stop right away contact a Medical doctor.

Consumption:

Let the injured drink water or milk and contact a Medical doctor.

5. Fire control:

The product is not inflammable.

As far as possible the product must be removed from fire treaten areas.

6. Precautions to be taken at a leak caused by an accident:

If larger leaks occur, contact the Local Authorities

Larger amounts of waste is covered/soaked up with sand or another material with abilities for absorption. The absorbed material is treated as a waste. Pct. 8 and 13

Avoid that the spilled product runs into the drainage

7. Handling and storage:

When handling the product, secure good ventilation in the area. If this is not possible wear an approved breathing mask.

Avoid contact with skin and eyes. If skin contact cannot be avoided one must use safety gloves. When risk for splash use eye protectors. Read point 8.

Store the product in the original container and keep it closed.

Danger of fire: -

8. Expose control/personal protection:

The following information about the ingredients has a limit value after the At-directions 96:

GV(ppm) GV (mg/m3)

Securing the limit value can be controlled by occupational hygienic measuring.

The following personal protection is recommended if necessary:

Breathing mask: Rubber half-maske/A2-filtre Gloves: Nitrile rubber gloves* Eye protection: -

*): It is important to make clear that there are many different types of nitrile gloves and it is necessary to prove the efficiency of the glove in question with the concerned product.

9. Physic-chemical qualities:

Aappearence:	Clear liquid	Solubility in water:	Miscible
Smell:	Strong smell	Distributing coefficient:	-
pH:	10	Flash point:	100°C
Boiling point:	232°C	Self-ignition temperature:	200°C
Melting/freezingpoint	- C	Limits of explosion:	0,7 - 5,9%
Steam	< 0,01(BuAc = 1)	Viscosity (20 °C):	5,9 mPa
pressure(20°C):	0,01 kg/l	Other:	-
Specific Gravity	0,988 kg/l		

10. Stability and reactivity:

The product is stable if used under normal conditions.

Substances with strong oxidation abilities (Acid. Strong base.) Must be avioded.

11. Toxicological information (unhealthy qualities):

Inhaling:

Vapour can cause headache, dizzyness

Skin contact:

The product can cause irritation if the skin is in contact with the product for a longer period of time.

Eye contact:

The product cause irritation if it gets into the eyes.

Consumption:

Consumption can causnausea, indisposition and possibly vomiting.

12. Environmental information:

Dangerousness in the water environment: The used ingredients are all 100% biodegradable.

Eco toxic: the product is not considered to have any acute toxic effect on the enviroment.

Lc_{50} (96 hours, carp): 2000mg/l

13. Removal:

On transport as waste: read point 14.

14. Transportation:

The product is not regarded as dangerous goods.

15. Regulatory information:

Danger indicating label on the package:

Irritates the eyes and the skin (R36)
If the product gets into the eyes wash immediately with water and contact a medical doctor (S26)

May cause skin mild irritation

Use limit: Must not be used by persons under 18 years (apprentices excepted).

Requests for specific education: None.

Further proclamation: None.

16. Other information:

Text for R-sentences mentioned in point 2 and 3:

R22: Consumption may be dangerous

S26: If the product gets into the eyes wash immediately with water and contact a medical doctor

R36: Irritates the eyes and the skin.

R38 Irritates the skin

R41: Risk for dangerous damage on the eye

Made by:Bodil Riisng, DVM, Voddervej 1, 6780 Skaerbaek

OXSILAN® MM-0705

Version *1.18*
Revision Date 01/24/2014

Print Date 01/24/2014

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	O SILAN MM-0705
MSDS Number	:	REL 10500
Company	:	Chemetall US, Inc. 675 Central Avenue New Providence, NJ 07974
Telephone	:	+18005264473
Telefax	:	+19084644658
Emergency telephone no	:	CHEMTREC - 800-424-9300

SECTION 2. HAZARDOUS COMPONENTS INFORMATION

Component	CAS-No.	Weight percent
Trade Secret Registry	735517-5281P	5.00 - 10.00
Ethanol	64-17-5	10.00 - 20.00

Unidentified ingredients are considered not hazardous under Federal Hazard Communication Standard (29CFR 1910.1200).

SECTION 3. HAZARDS IDENTIFICATION

Emergency Overview

Form	:	liquid
Colour	:	colourless
Odour	:	alcohol-like
Hazard Summary	:	Flammable/Combustible Repeated or prolonged exposure may cause irritation of eyes and skin.

Route(s) of Entry :	Inhalation	Skin	Ingestion
	no	yes	yes

Carcinogenicity:

NTP	No substance in this product is listed by NTP as a carcinogen
IARC	No substance in this product is listed by IARC as a carcinogen
OSHA	No substance in this product is regulated by OSHA as a carcinogen

SECTION 4. FIRST AID MEASURES

Inhalation	:	Remove to fresh air. If symptoms persist, call a physician.
Skin contact	:	Wash off with plenty of water.If skin irritation persists, call a

physician.

Eye contact	:	Keep eye wide open while rinsing.Rinse immediately with plenty of water for at least 15 minutes.If eye irritation persists, consult a specialist.
Ingestion	:	Rinse mouth.Never give anything by mouth to an unconscious person.Obtain medical attention.

SECTION 5. FIREFIGHTING MEASURES

Flash point	:	42.77 °C (108.99 °F) Tag closed cup
Lower explosion limit	:	Note: no data available
Upper explosion limit	:	Note: no data available
Auto-ignition temperature	:	No information available.
TDG Flammability Class	:	3
Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Carbon dioxide blanket Dry chemical Foam
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Further information	:	Use water spray to cool unopened containers.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions	:	Use personal protective equipment. Ventilate the area.
Methods for cleaning up	:	Wear personal protective equipment. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
Additional advice	:	Never return spills in original containers for re-use.

SECTION 7. HANDLING AND STORAGE

Handling

Handling : Unscrew closure slowly. Allow all pressure to escape through threads before removing closure

Storage

Requirements for storage areas and containers : Store indoors in a cool, well-ventilated place
Keep away from open flames, hot surfaces and sources of ignition.
Keep containers dry and tightly closed to avoid moisture absorption and contamination.
Keep drum out of sun and away from heat.
Store below 95F.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Component	ACGIH TLV (TWA)	OSHA PEL (TWA)
Trade Secret Registry	NONE	NONE
Ethanol	1,884.000000 mg/m3	NONE

Engineering measures : The bath must be treated with Calcium Hydroxide prior to discharge to the local POTW.

Eye protection : Safety glasses with side-shields

Hand protection : Impervious gloves

Skin and body protection : Rubber or plastic apron

Respiratory protection : If the occupational exposure limits cannot be met, suitable respirator equipment shall be worn.

Hygiene measures : Avoid contact with eyes.
Wear suitable gloves and eye/face protection.
Wear suitable protective clothing.
Wash hands before breaks and immediately after handling the product.
Provide adequate ventilation.
Do not inhale fumes.
Keep away from heat and flame.
Keep away from food and drink.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

pH	:	5.5 - 6.5 Note: +/- 0.5
Freezing point	:	-1.11 °C (30.00 °F)
Boiling point/boiling range	:	Note: no data available
Vapour pressure	:	Note: no data available
Bulk density	:	8.2000 lb/gal
Water solubility	:	Note: completely soluble
Relative density	:	0.984
Evaporation rate	:	Note: (Water =1) Less than 1

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	:	Heat, flames and sparks.
Materials to avoid	:	Strong oxidizing agents Bases
Hazardous decomposition products	:	Carbon dioxide (CO2) Carbon monoxide

SECTION 11. TOXICOLOGICAL INFORMATION

Toxicity: : Mixture; Not Determined.

Acute oral toxicity

Ethanol : LD50, rat
Dose: 7,060.000000 mg/kg

SECTION 12. ECOLOGICAL INFORMATION

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Advice on Disposal	:	Refer to all federal, provincial, state and local regulation prior to disposition of container and unused contents by reuse, recycle or disposal.

SECTION 14. TRANSPORT INFORMATION

Refer to Bill of Lading.

SECTION 15. REGULATORY INFORMATION

TSCA Status	:	All components of this material comply with US TSCA requirements.
SARA 313 Components	:	NONE
CERCLA Reportable Quantity	:	NONE
California Prop. 65	:	N.D
NFPA	:	1 2 0
HMIS	:	1 2 0 B

SECTION 16. OTHER INFORMATION

Further information

Chemetall US, Inc. warrants that the products described herein will conform with its published specifications. The products supplied by Chemetall and information related to them are intended for use by buyers having necessary industrial skill and knowledge. Buyers should undertake sufficient verification and testing to determine the suitability of the Chemetall materials for their own particular purpose. Since buyer s conditions of use of products are beyond Chemetall s control, Chemetall does not warrant any recommendations and information for the use of such products. CHEMETALL DISCLAIMS ALL OTHER WARRANTIES INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR ANY PARTICULAR PURPOSE IN CONNECTION WITH THE USE OF ITS PRODUCTS.

SAFETY DATA SHEET
Effective date: 4 January 2013
Replaced edition from: 4 June 2012
Distribution date: 4 January 2013

1907/2006/EC & GHS
Safety Data Sheet

TRADE NAME
PANEX® CARBON FIBER

1. Identification of the substance / preparation and of the company

1.1 Product identifier

Product name	**:**	PANEX® CARBON FIBER
Synonyms	**:**	n/a
Chemical family	**:**	Carbon fiber
Product description	:	Article

1.2 Relevant identified uses of the substance or mixture and uses advised against

1.2.1 Relevant uses : Industrial applications

1.2.2 Uses advised against : None known

1.3 Details of the supplier of the safety data sheet

Company **:** Zoltek Zrt
H-2537 Nyergesujfalu
Hungary
+36-33-536-021

Zoltek Companies, Inc.
3101 Mckelvey Road
St. Louis, MO 63044
USA
(314) 291-5110

E-mail enquiry : msds@zoltek.com

1.4 Emergency phone company : +36-33-536-021
(314) 291-5110

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2. Hazards Identification

2.1 Classification of the substance or mixture

Product definition : Article

2.1.1 Classification according to Regulation (EC) No 1272/2008 [CLP]

: Not classified

2.1.2 Classification according to Regulation 67/548/EEC or 1999/45/EC

Hazard symbols : None
R-phrases : None
The product does not require a hazard warning label in accordance with EC-directives

2.2 Label elements

Labeling according to Regulation 67/548/EEC or 1994/45/EC

Hazard symbols : none
R-phrases : none
S-phrases : none
Special labeling : n/a

2.3 Other hazards

Physio-chemical hazards : See chapter 10
In the supplied form the product is not explosive at all; however, the build-up of fine dust can lead to a risk of dust explosions.

Human health dangers : See chapter 11 and below
Eye : Dust may cause temporary irritation.
Skin : Dust may cause mild irritation. In some cases, the dust may cause allergic skin reactions.
Inhalation : Dust may cause mild irritation.

Environmental hazards : See chapter 12

Other hazards : This product and its dusts are electrically conductive

Least: 0; Slight: 1; Moderate: 2; High: 3; Extreme: 4	Health	Fire	Reactivity
Carbon fiber	1	0	0
Sizing	1	1	0

3. Composition / Information on ingredients

3.1 Product-type : Article

Component	CAS. NO	%	LIMITS FOR AIR CONTAMINANTS
Carbon fiber, Polyacrylonitrile (PAN)-based carbon	CAS: 7440-44-0	91.0-99.8	

OSHA and ACGIH have not established air contamination for carbon fibers. Under certain conditions this substance may be a nuisance dust. OSHA has an established standard for particulates not otherwise regulated (nuisance dust) set at 5 mg/m^3 (respirable fraction) and 15 mg/m^3 (total dust). ACGIH has established an exposure value of 3 mg/m^3 (respirable fraction) and 10 mg/m^3 (total).

Sizing	Proprietary	0.2-9.0%

4. FIRST AID MEASURES

Eye contact: Flush eyes with water for 15 minutes.
Skin contact: Wash affected areas thoroughly with soap and water.
Inhalation: Remove from the area of the dust to fresh air. Seek medical attention if you feel unwell.
Ingestion: In the event of deliberate ingestion, do not induce vomiting unless directed to do so by consulting with a doctor.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Normal firefighting media and procedures
Restrictions: Use of extinguishing media is dependent on processing plant conditions.
Unusual fire & explosion hazards: Airborne fibers are electrically conductive.

Flashpoint: not determined
Main combustion gas: CO_2, CO and a minute amount of N_2, HCN and H_2O.
Personal Protection: Self-contained breathing apparatus

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6. ACCIDENTAL RELEASE MEASURES

Personal precautions: N/A
Environmental precautions: N/A
Methods for cleaning up: In case of spill, collect the spilled materials. If the material is not contaminated, put it into a clean container and it can be reused. Otherwise, dispose of it properly. Because the dust is electrically conductive and may become airborne, clean up with a vacuum. If an electrical appliance is used, take the steps necessary to avoid the risk of electrical shock.

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7. HANDLING AND STORAGE

Precautions for safe handling: No special measures necessary if used properly.
Conditions for safe storage: Airborne particles and filaments should be controlled so as to minimize skin irritation and electrical shorts in switch gears, etc. due to conductivity of fiber.
Other precautions: Protect all electrical equipment, in or near areas in which fiber is handled or used, from contact with airborne particles and filaments to avoid possible damage caused by electrical shorts.

---

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory protection: Personal dust respirators applicable if high degree of fiber fly is experienced.
Ventilation: Yes – local exhaust for airborne fiber removal.
Protective gloves: The use of protective gloves is recommended.
Eye protection: Safety glasses.
Other protective clothing or equipment: Recommend disposable protective garments to eliminate possible skin irritation.
Work / hygienic practices: Gloves (Tyvek) and NIOSH approved nuisance dust masks. Before eating, drinking or smoking, wash hands and face thoroughly with soap and water.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Black fiber
Odor: Odorless
pH: N/A
Melting point: N/a
Freezing point: N/A
Boiling point: N/A
Flashpoint: N/A
Flammability: N/A
Lower explosion limit: N/A

Upper explosion limit: N/A
Vapor pressure: N/A
Vapor density: N/A
Specific gravity: 1.82 g/cm^3 (H_2O = 1)
Evaporation rate: N/A (Butyl Acetate = 1)
Solubility in water: Negligible (Dispersible)
Partition coefficient: N/A
Auto ignition temperature: N/A
Decomposition temperature: Begins to oxidize at temperatures >240°C in standard air environment

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10. STABILITY AND REACTIVITY

Stability: Stable
Conditions to avoid: Can react with strong oxidizing agents.
Incompatible materials: See above.
Hazardous decomposition or byproducts: Products of combustion and decomposition depend on other materials present in the fire and the fire conditions. Burning will produce CO_2, CO, and a minute amount of N_2, HCN and H_2O. Avoid inhalation.
Hazard polymerization: Will not occur. Carbon fiber is basically inert.

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11. TOXICOLOGICAL INFORMATION

Acute oral toxicity: not determined
Acute dermal toxicity: not determined
Acute inhalation toxicity: not determined
Irritant effect on eyes: not determined
Irritant effect on skin: not determined
Sensitization: not determined
Chronic toxicity: not determined
Reproduction toxicity: not determined
Carcinogenicity: not determined
Mutagenicity: not determined
Signs & Symptoms of exposure: possible rash

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12. ECOLOGICAL INFORMATION

Aquatic toxicity: not determined
Biological degradability: not determined
Bioaccumulative potential: not determined
Mobility in soil: not determined
General information: Ecological data is not available.

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13. DISPOSAL CONSIDERATIONS

Landfill sites – industrially approved. Do not incinerate. If necessary, consult local, state, and federal agencies prior to disposal of this material.

Contaminated packaging – packaging that cannot be cleaned should be disposed of as for products. Uncontaminated packaging may be taken for recycling.

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14. TRANSPORATION INFORMATION

US/International shipping information under DOT/ADR/IMDG/IATA regulations: This product is not regulated as dangerous or hazardous goods under DOT, ARD, IMDG, IATA, or UN shipping regulations.

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15. REGULATORY INFORMATION

This product is not classified as a toxic chemical or hazardous material. No special warning label is required.

TSCA (US) NO: Carbon fiber 7440-44-0
EINECS NO: N/A
WHMIS (Canada): N/A
CAS: 7440-44-0
OSHA: N/A
SARA Title III Section 313 Toxic chemicals: None

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16. OTHER INFORMATION

Disclaimer: This information is furnished without warranty, expressed or implied, except that it is believed to be accurate to the best knowledge of Zoltek Companies, Inc. The information presented in this SDS is related only to specific material designated herein. Zoltek Companies, Inc. assumes no legal responsibility for the use or reliance upon these data. The user should review any recommendation in the specific context of the intended use to determine whether appropriate.

Safety Data Sheet

Section 1: PRODUCT AND COMPANY IDENTIFICATION

SDS Identification Name: Polyspeed® Laminates
SDS Number: 439-7278-POLY-0000-00 **Date:** September 1, 2010 **Page:** 1 of 6
Supersedes SDS: New

Manufacturer:
Hexcel®
11711 Dublin Boulevard
Dublin, CA 94568-2832

Emergency Telephone Number:
800-433-5072 (24-Hour) Hexcel®

Information Telephone Number:
925-551-4900 (Normal Business Hours-PT)

Product Identification Number: Polyspeed® Laminates

Chemical Family: Cured Epoxy Resin on Fiberglass

Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS® Number	% by Weight	OSHA (PEL)	ACGIH® (TLV®)
Fiberglass fiber synthetic, vitreous continuous filament	65997-17-3	50-75	15 mg/m^3 (Total) 5 mg/m^3 (Respirable)	5 mg/m^3 (Inhalable) 1 f/cc (Respirable)

This product is not classified as a Hazardous Chemical as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Section 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
Appearance and Odor:
Laminate with no distinctive odor.

Statements of Hazard:
Warning! Dust generated from machining, grinding or sanding the product may be combustible and could result in fire and/or explosion should the necessary dust concentration in air and ignition source be present.

Dust or particulate from machining, grinding or sawing the product may cause irritation to the eyes, skin and respiratory tract.

Handling the product may cause cuts and abrasions.

Primary Routes of Exposure:
Eye--Yes Skin--Yes Inhalation--Yes Ingestion--No

HMIS® Rating:
Health--1 Flammability--0 Reactivity--0 Special—None

Section 3: HAZARDS IDENTIFICATION (Continued)

EMERGENCY OVERVIEW (continued):

Potential Health Effects:

Eye: Dust or particulate from machining, grinding or sawing the product may cause mechanical irritation.

Skin: Dust or particulate from machining, grinding or sawing the product may cause mechanical irritation.

Inhalation: Dust or particulate from machining, grinding or sawing the product may cause irritation to the respiratory tract.

Ingestion: The effects of ingestion are unknown. Mechanical irritation may occur.

Medical Conditions Aggravated by Exposure: Preexisting eye, skin or respiratory disorders may be aggravated by exposure from machining, grinding or sawing the product.

Carcinogenic Information: None of the components present in the product at concentrations equal to or greater than 0.1 % are listed or regulated by IARC, NTP, OSHA or ACGIH® as a carcinogen.

Other:	**OSHA (PEL)**	**ACGIH® (TLV®)**
Exposure limits for product dust as [Particulate Not Otherwise Regulated (PNOR) by OSHA or Classified (PNOC) by ACGIH®]:	15 mg/m^3 (Total) 5 mg/m^3 (Respirable)	10 mg/m^3 (Inhalable) 3 mg/m^3 (Respirable)

Section 4: FIRST AID MEASURES

Eye: In case of contact with the dust or particulate from the product, immediately flush with large amounts of water for at least 15 minutes, keeping the eyelids open. Get medical attention immediately.

Skin: Use normal medical treatment for cuts or abrasions. In case of contact with dust or particulate from the product, immediately wash skin with soap and plenty of water. Get medical attention immediately, if irritation develops.

Inhalation: If dust or particulate are inhaled in a large quantity, remove to fresh air. Get medical attention immediately.

Ingestion: In case of ingestion, mechanical irritation may occur. Get medical attention, if necessary.

Section 5: FIRE FIGHTING MEASURES

Flash Point/Method of Determination: Not determined

Means of Extinction: Use water-spray, dry chemical or CO_2 to extinguish fires.

Special Fire Hazards: Avoid exposure through use of a self-contained, positive-pressure breathing apparatus. Dust generated from machining, grinding or sanding the product may be combustible and could result in fire and/or explosion should the necessary dust concentration in air and ignition source be present.

Section 6: ACCIDENTAL RELEASE MEASURES

Procedures in case of Accidental Release or Leakage: No special precautions required.

Section 7: HANDLING AND STORAGE

Precautions to be taken in Handling and Storage: Maintained sealed against contamination from dirt or moisture.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye/Face Protection: Usually not required. Avoid eye and skin contact. Wear safety glasses with side shields when machining, grinding or sawing the product.

Skin Protection: Use gloves, as necessary, to protect from cuts or abrasions while handling the product. Wear protective clothing, as necessary, to protect from the dust or particulate generated when machining, grinding or sawing the product.

Respiratory Protection: Usually not required. If dust or particulate are being generated from machining, grinding or sawing the product, use a NIOSH approved dust respirator.

Ventilation: Use local exhaust sufficient to control the dust or particulate generated during machining, grinding or sawing the product. If an exhaust ventilation is not available or is inadequate, use a NIOSH approved respirator, as appropriate.

General Hygiene Recommendations: Good personal hygiene practices should be followed at all times. Before eating, drinking, smoking or using toilet facilities, wash face and hands thoroughly with soap and water. Use vacuum equipment to remove the product dust or particulate from clothing and work areas. Compressed air is not recommended.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor..... Laminate with no distinctive odor.
Boiling Point (^{o}F/^{o}C)..... N/A
Melting Point (^{o}F/^{o}C)..... N/A
Density (lbs./ft^{3})(Water=62.3)..... N/A
pH of Undiluted Product..... N/A
Vapor Pressure (mm Hg.)..... N/A
Vapor Density (Air=1).....N/A
Viscosity..... N/A
Volatile [Percent (%) by Weight]..... N/A
Percent (%) VOC..... N/A
Solubility in Water.....Not Soluble

Section 10: STABILITY AND REACTIVITY

Stability: Stable

Incompatible Materials: None

Products evolved from Heat of Combustion or Decomposition: The products of combustion and decomposition depend on other materials present in the fire and the actual conditions of the fire. Component information says that burning should produce carbon and nitrogen oxides, sulphur and other unidentified gases and vapors that may be toxic. Avoid inhalation.

Hazardous Polymerization: None

Section 11: TOXICOLOGICAL INFORMATION

Component Toxicity Data:
Median Lethal Dose (Species):
Oral (LD_{50})...Not determined
Inhalation (LC_{50})...Not determined
Dermal (LD_{50})...Not determined

Irritation Index, Estimation of Irritation (Species):
Skin...Not determined
Eyes...Not determined
Inhalation...Not determined

Section 12: ECOLOGICAL INFORMATION

Total Product Data:
Not regarded as dangerous for the environment.

Section 13: DISPOSAL CONSIDERATIONS

Waste Disposal Methods: It is the responsibility of the generator to comply with all federal, state, provincial and local laws and regulations. We recommend that you contact an appropriate waste disposal contractor and environmental agency for relevant laws and regulations. Under the U.S., Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.

Section 14: TRANSPORT INFORMATION

DOT:
Proper Shipping Name.....Not regulated
Hazard Class..... Not regulated
Identification Number.....Not regulated
Packing Group.....Not regulated
Label Required..... None

Section 15: REGULATORY INFORMATION

SARA Title III:
Section 302/304 Extremely Hazardous Substance:
None

Section 311 Hazardous Categorization:
None

Section 313 Toxic Chemicals:
None

CERCLA Section 102(a) Hazardous Substance:
None

RCRA Information: Currently, the product is not listed in federal hazardous waste regulations 40 CFR, Part 261.33, paragraphs (e) or (f), i.e. chemical products that are considered hazardous if they become wastes. State or local hazardous waste regulations may also apply if they are different from the federal regulation. It is the responsibility of the user of the product to determine at the time of disposal, whether the product meets relevant waste classification and to assure proper disposal.

WHMIS (Canada):
Classification:
None

This product has been classified in accordance with hazard criteria of the "Controlled Products Regulations" and this SDS contains all the information required by the "Controlled Products Regulations."

Ingredient disclosure list:
Fibrous glass (CAS® # 65997-17-3)

U.S., EPA and TSCA Information: This product is an article as defined by TSCA and is not required to be listed in the TSCA Inventory.

Ozone Depletion Information: This product does not contain or is not manufactured with ozone depleting substances as identified in Title VI, Clean Air Act "Stratospheric Ozone Protection" and the regulations set forth in 40 CFR, Part 82.

Section 16: OTHER INFORMATION

Special Precautions for Carbon: Airborne carbon fibers, dust or particulate may create electrical short-circuits that could result in damage to or malfunctioning of electrical equipment.

Explanation and Disclaimer: Wherever such words or phrases as "hazardous," "toxic," "carcinogen," etc. appear herein, they are used as defined or described under state employee right-to-know laws, Federal OSHA laws or the direct sources for these laws such as the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), etc. The use of such words or phrases should not be taken to mean that we deem or imply any substance or exposure to be toxic, hazardous or otherwise harmful. **Any exposure can only be understood within the entire context of its occurrence, which includes such factors as the substance's characteristics as defined in the SDS, amount and duration of exposures, other chemicals present and preexisting individual differences in response to the exposure.**

The data provided in this SDS is based on the information received from our raw material suppliers and other sources believed to be reliable. We are supplying you this data solely in compliance with the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200 and other Federal and state laws as described in Section 15: Regulatory Information.

The information contained in this SDS is proprietary and confidential to Hexcel Corporation. This SDS and the information in it are not to be used for purposes other than compliance with the Federal OSHA Hazard Communication Standard. If you have received this SDS from any source other than Hexcel Corporation or its authorized agent, the information contained in it may have been modified from the original document and it may not be the most current revision.

Liability, if any, for use of this product is limited to the terms contained in our sale terms and conditions. We do not in any way warrant (expressed or implied, including any implied warranty for merchantability or fitness for a particular purpose) the data contained or the product described in this SDS. Additionally, we do not warrant that the product will not infringe any patent or other proprietary or property rights of others.

Prepared by: Darryl Ong,
Hexcel Corporate Safety and Health,
Senior Product Information Specialist

Revision History:
09/01/10 new SDS

SECTION 1 Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : PYROSTOP 6

Common chemical name : Sulphur hexafluoride

CAS nr : 2551-62-4

EC Number : 219-854-2

REACH registration numbe : 01-2119458769-17

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1 Relevant identified uses : Gas dielectric agent / Electric insulation for high and medium voltage

1.3. Details of the supplier of the safety data sheet : INVENTEC PERFORMANCE CHEMICALS SA
20 rue de Bourgogne
BP 211
69802 SAINT-PRIEST Cedex France
Tel : +33 (0) 4 72 28 13 00
Fax : +33 (0) 4 72 28 13 41

e-mail : ContactFDS@inventec.dehon.com

1.4 Emergency telephone number : EMERGENCY TELEPHONE NUMBER (24h/24) : + 33 (0) 1 72 11 00 03
Anti-poison Center : INRS/ORFILA (France) : +33 (0) 1 45 42 59 59
Anti-poison Centre (Spain) : +34 91 562 04 20
Anti-poison Centre (Belgium) : +32 70 245 245
Anti-poison Centre (Netherlands) : +31 30 274 8888
Anti-poison Centre (United Kingdom) : +44 870 600 6266
Poisons Information Centre (Hungary) : +36 80 201 199

SECTION 2 Hazards identification

2.1. Classification of the substance or mixture

2.1.1. Regulation (EC) No 1272/2008 (CLP)

Physical hazards : Gases under pressure - Liquefied gas (Press. Gas) - H280

2.1.2 Directive EEC/67/548 or 1999/45/ CE : Not classified as dangerous product.

2.2. Label elements

Hazard pictograms

Signal words : Warning

Hazard statements : H280 : Contains gas under pressure; may explode if heated

Precautionary statements :

• Storage : P410 + P403 : Protect from sunlight Store in a well-ventilated place

- Further data : Greenhouse fluorinated gas falling within Kyoto Protocol

2.3. Other hazards

Adverse human health effects : In high concentrations may cause asphyxiation.
Contact with liquid may cause cold burns/frostbite.

SECTION 3 Composition/information on ingredients

3.1./3.2. Substance / Preparation : Substance.

Components contributing to the hazard :

Substance name		Contents	CAS No	EC No	Index No	Ref REACH	Classification
Sulphur hexafluoride	:	> 95 %	2551-62-4	219-854-2	-----	01-2119458769-17	Not classified. (DSD/DPD) --- Liquefied gas;H280

SECTION 4 First aid measures

4.1. Description of first aid measures

Inhalation : Move the affected person away from the contaminated area and into the fresh air
Make the person rest

Skin contact : In the event of contact with the liquid: treat resulting frostbite as a burn
Immediately remove contaminated clothing or footwear
Immediately rinse with plenty of water
If skin burns appear, call a doctor immediately

Eye contact : Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum)
Consult an eye specialist immediately, even if there are no immediate symptoms.

Ingestion : Not specifically applicable (gas)

Protection of first-aiders : Do not enter without an appropriate protective equipment
- self-contained breathing apparatus

4.2. Most important symptoms and effects, both acute and delayed

Acute symptoms : At high concentrations:
Anoxia (asphyxia).
Narcosis
Loss of consciousness

4.3. Indication of any immediate medical attention and special treatment needed : No information available

SECTION 5 Fire-fighting measures

5.1. Extinguishing media

Suitable extinguishing media : All extinguishing agents can be used

Unsuitable extinguishing media : None to our knowledge. If there is a fire close by, use suitable extinguishing agents

5.2. Special hazards arising from the substance or mixture

Specific hazards : Not classified as flammable according to EC criteria, but may present a risk in the event of a fire
On heating or during combustion :
Toxic gases are released

5.3. Advice for firefighters

Specific fire fighting methods : Close the valve if possible
Cool down the containers exposed to heat with a water spray
Do not attempt to fight the fire without suitable protective equipment

Protection of fire-fighters : Self-contained breathing apparatus
Impermeable protective equipment

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SECTION 5 Fire-fighting measures (continued)

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures : Avoid contact with skin and eyes
Remove all sources of ignition
Do not smoke
Do not breathe vapours
Evacuate the danger area.
Stop the leak.
Heavy vapours. Shut off low-level openings in the vicinity (ventilation shafts, drains...).

6.2. Environmental precautions : -

6.3. Methods and material for containment and cleaning up : Mechanically ventilate the spillage area.

- Recovery : Let the product evaporate

6.4 Reference to other sections : For further information refer to section 8 "Exposure controls/personal protection"

SECTION 7 Handling and storage

7.1. Precautions for safe handling

Technical measures : Ventilation

Industrial hygiene : Do not drink, eat or smoke in the workplace

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

- Recommended : Store :
- the container tightly closed
- in a cool, well-ventilated area
- away from direct sunlight
- away from any source of heat

Incompatible products : Strong oxidizing agents
Alkaline earth metals

Packaging materials

- Recommended : Ordinary steel

7.3. Specific end use(s) : -

SECTION 8 Exposure controls/personal protection

8.1. Control parameters

Engineering measures : Ensure good ventilation of the work station

8.1.1. Occupational Exposure Limits : Sulphur hexafluoride : USA (OSHA) : PEL - TWA (8h; mg/m³) : 6000
Sulphur hexafluoride : USA (OSHA) : PEL - TWA (8h; ppm) : 1000
Sulphur hexafluoride : United Kingdom : WEL - TWA (8h; mg/m³) : 6070
Sulphur hexafluoride : United Kingdom : WEL - TWA (8h; ppm) : 1000
Sulphur hexafluoride : United Kingdom : WEL - STEL (15min; mg/m³) : 7590
Sulphur hexafluoride : United Kingdom : WEL - STEL (15min; ppm) : 1250
Sulphur hexafluoride : France : LEP - VME (8h; mg/m³) : 6000
Sulphur hexafluoride : France : LEP - VME (8h; ppm) : 1000
Sulphur hexafluoride : Germany : MAK - TWA (8h; mg/m³) : 6100
Sulphur hexafluoride : Germany : MAK - TWA (8h; ppm) : 1000
Sulphur hexafluoride : Germany : MAK - STEL (15min; mg/m³) : 48800
Sulphur hexafluoride : Germany : MAK - STEL (15min; ppm) : 8000

SECTION 8 Exposure controls/personal protection (continued)

Sulphur hexafluoride : Belgium : GWBB - TWA (8h; mg/m³) : 6057
Sulphur hexafluoride : Belgium : GWBB - TWA (8h; ppm) : 1000

8.2. Exposure controls

Personal protection :

* **- Respiratory protection** : In the event of insufficient ventilation: Mask with AX canister
In a confined area : Self-contained breathing apparatus (ARI)

- Hand protection : Protective gloves made of rubber or PVC
Neoprene protective gloves

- Eye protection : Sealed safety goggles with side shields

- Skin protection : Majority cotton clothing

SECTION 9 Physical and chemical properties

9.1. Information on basic physical and chemical properties

9.1.a. Appearance

Physical state	: Compressed liquefied gas
Colour	: Colourless
9.1.b. Odour	: Odourless
9.1.c. Odour threshold	: No data
9.1.d. pH	: Not applicable
9.1.e. Melting point / Freezing point	: -50.8 °C
9.1.f. Initial boiling point - boiling range	: -63.8°C
9.1.g. Flash point	: Not applicable
9.1.h. Evaporation rate	: No data
9.1.i. Flammability	: Non flammable.
9.1.j. Explosion limits (lower - upper)	: None
9.1.k. Vapour pressure	: 37.1 bar at 45°C
9.1.l. Vapour density	: 5.1
9.1.m. Relative density	: 1.56 at 0 °C
9.1.n. Solubility	
-in water	: 0.04 g/l at 20 °C Practically insoluble
- in organic solvents	: - alcohols - ethers. Soluble in :
9.1.o. Partition coefficient : n-octanol / water	: 1.68 (log Pow)
9.1.p. Auto-ignition temperature	: No data
9.1.q. Thermal decomposition	: 200 °C (humid air) 800 °C (dry air)
9.1.r. Viscosity	: Not applicable
9.1.s. Explosive Properties	: Not explosive material according to EC criteria
9.1.t. Oxidising properties	: Non oxidizing material according to EC criteria

9.2. Other information

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SECTION 9 Physical and chemical properties (continued)

Critical temperature : : 45.6°C
Critical pressure : : 3719 kPa

SECTION 10 Stability and reactivity

10.1. Reactivity : -
10.2. Chemical stability : Stable up to 500 °C
10.3. Possibility of hazardous reactions : -
10.4. Conditions to avoid : Heat or source of heat
10.5. Incompatible materials : - reactive metals (Al, K, Zn ...)
- strong oxidizing agents
10.6. Hazardous decomposition products : : On thermal decomposition (pyrolysis), releases :
Hydrogen fluoride
Sulfur monofluoride, difluoride, tetrafluoride and decafluoride
Sulphur dioxide

SECTION 11 Toxicological information

11.1. Information on toxicological effects
Acute toxicity : Asphyxiating
Skin corrosion/irritation : No specific data
Serious eye damage/irritation : No specific data
Respiratory or skin sensitization : No data available
Germ cell mutagenicity : No mutagenic effect
Carcinogenicity : No carcinogenic effect
Reproductive toxicity : No teratogenic effect
STOT-single exposure : No specific data
STOT-repeated exposure : No specific data
Aspiration hazard : Not applicable
Other information : Contact with liquefied gas may cause severe ocular lesions
Contact with liquid causes frostbite.

SECTION 12 Ecological information

12.1. Toxicity
Effects on the aquatic environment : No information available
12.2. Persistence and degradability
Persistence : The product persists in air in inert form
Degradability :
- Hydrolysis: : Water / Earth: Half-life : > 1000 y
- Photolysis: : Half-life : > 1000 y
12.3. Bioaccumulative potential : Not bioaccumulable.
Octanol/water partition coefficient : 1.68 (log Pow)

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SECTION 12 Ecological information (continued)

Bioconcentration factor. : BCF : 89

12.4. Mobility in soil : -

Volatility : Air : Henry's constant : 452 kPa.m3/mol
Extremely volatile
In aqueous medium :
Rapid evaporation : Half-life = 3.5 h

Adsorption/desorption: : Product adsorbs little onto the soil

12.5. Results of PBT and vPvB assessment : This substance is considered not to be PBT and vPvB

12.6. Other adverse effects

Global warming potential: : GWP (CO2=1) = 22200

SECTION 13 Disposal considerations

13.1. Waste treatment methods

CONTAMINATED PACKAGING :

Destruction/Disposal : Dispose of at an licensed site

NOTE : The user's attention is drawn to the possible existence of specific european, national or local regulations regarding disposal

SECTION 14 Transport information

14.1. UN number : UN 1080

14.2. UN proper shipping name : SULPHUR HEXAFLUORIDE

14.3. Transport hazard class(es)

Rail/road (RID/ADR) : Class : 2

Sea transport : Class : 2.2

Air transport (OACI/IATA) : Class : 2.2

Hazard Label(s) : 2.2

14.4. Packing group : Not applicable

14.5. Environmental hazards : Not classified as dangerous to the aquatic environment
Marine pollutant : NO

14.6. Special precautions for user

Rail/road (RID/ADR) : Classification code : 2A
Hazard identification number : 20
Tunnel restriction code : (C/E)

Sea transport : EmS Nr : F-C, S-V
Segregation group : -

Air transport (OACI/IATA) : Cargo aircraft:
Packing instruction: 200
Quantity: 150kg
Passenger aircraft:
Packing instruction: 200
Quantity: 75kg

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SECTION 14 Transport information (continued)

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not applicable

NOTE : The above regulatory prescriptions are those valid on the date of publication of this sheet However, given the possible evolution of transport regulations for hazardous materials, in case the present sheet is dating back to more than 12 months ago, it would be advisable to check their validity with your commercial agency

SECTION 15 Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture : Ensure all national/local regulations are observed.

France : Professional diseases(table(s) nr 32) : applicable
Specific medical surveillance : Decree of the 11th july1977 : applicable

REGULATION EC No 842/2006 : Greenhouse fluorinated gas falling within Kyoto Protocol

15.2. Chemical safety assessment : No information available

SECTION 16 Other information

Further information : Product for industrial use only
For more information regarding the use of this product, please refer to our technical information or contact the sales department in your region
This safety data sheet has been written in conformity with the regulation (UE) 453/2010.

Text of H-Phrases in § 3 : H280 - Contains gas under pressure; may explode if heated

*** Update** : Modifications are indicated by an asterisk (*)

This sheet complements the technical sheets but does not replace them. The information given is based on our knowledge of the product, at the time of publication. It is given in good faith.
Besides, the attention of the user is drawn to the possible risks incurred by using the product for any other use than that for which it was intended.
In no way does this exempt the user from knowing and applying all the regulations controlling his activity. He alone will take on the responsibility for taking the precautions involved by the use of the product.
The aim of all the mandatory regulations mentionned is just to help the user to fulfil his obligations regarding the use of hazardous products.

This information must not be considered exhaustive. It does not exempt the user from ensuring that other obligations than those mentioned could apply, related to the storage and use of the product, this being his sole responsibility.

End of document

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Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Rando HDZ 22, 32, 46, 68, 100

Product Use: Hydraulic Oil
Product Number(s): 254609, 254610, 254611, 273260, 273261, 273262, 273263, 273264, 278065
Synonyms: Rando HDZ 22, 32, 46, 68 ISOCLEAN Certified
Company Identification
Chevron Products Company
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevron.com
Product Information: 1 (800) 582-3835, LUBETEK@chevron.com

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Not classified as hazardous according to 29 CFR 1910.1200 (2012).

HAZARDS NOT OTHERWISE CLASSIFIED: Not Applicable

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	70 - 99 %weight

SECTION 4 FIRST AID MEASURES

Description of first aid measures
Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Most important symptoms and effects, both acute and delayed
IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

DELAYED OR OTHER HEALTH EFFECTS: Not classified

Indication of any immediate medical attention and special treatment needed
Note to Physicians: In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Unusual Fire Hazards: Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs).

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge. Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	--	--	--
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless to yellow
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)
Vapor Density (Air = 1): >1
Initial Boiling Point: 315°C (599°F)
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: Not Applicable
Melting Point: No data available
Density: 0.86 kg/l @ 15°C (59°F)
Coefficient of Therm. Expansion / °F: Not Applicable
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): No Data Available

Flashpoint: (Cleveland Open Cup) 150 °C (302 °F) Minimum
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for product components.

Skin Corrosion/Irritation: The skin irritation hazard is based on evaluation of data for product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for product components.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.

Carcinogenicity: The hazard evaluation is based on data for components or a similar material.

Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).
These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.
The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:
Not applicable

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1.	Immediate (Acute) Health Effects:	NO
2.	Delayed (Chronic) Health Effects:	NO
3.	Fire Hazard:	NO
4.	Sudden Release of Pressure Hazard:	NO
5.	Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Hydraulic oil)

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 1 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:
Label Category : INDUSTRIAL OIL 1 - IND1

REVISION STATEMENT: This revision updates the following sections of this Safety Data Sheet: 1, 16.
Revision Date: AUGUST 14, 2015

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code

API - American Petroleum Institute	SDS - Safety Data Sheet
HMIS - Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to the 29 CFR 1910.1200 (2012) by Chevron Energy Technology Company, 6001 Bollinger Canyon Road San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name
Benzin, Rense

Product no.
-

REACH registration number
-

Other means of identification

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses of the substance or mixture
Applicated for extraction of fats and as a solvent in adhesives and paint products.
The full text of any mentioned and identified application categories are given in section 16

1.3. Details of the supplier of the safety data sheet

Company and address
Borup Kemi I/S
Bækgårdsvej 53
4140 Borup
Tlf: 5756 0020
Fax: 5756 0021
www.borup-kemi.dk

Contact person
-

E-mail
kontakt@borup-kemi.dk

SDS date
18-05-2011

SDS Version
1.0

1.4. Emergency telephone number

Use your national or local emergency number
See section 4 “First aid measures”

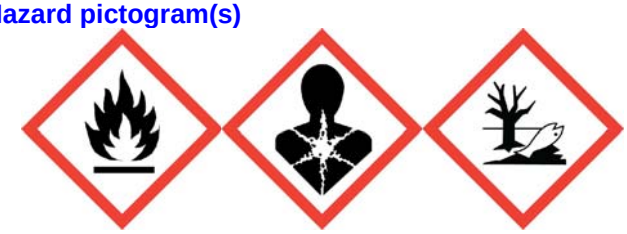
SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Aquatic Chronic 2, Asp. Tox. 1, Flam. Liq. 2

2.2. Label elements

Hazard pictogram(s)



Signal word

Danger!

Hazard statement(s)

Highly flammable liquid and vapour. (H225)
May be fatal if swallowed and enters airways. (H304)
Toxic to aquatic life with long lasting effects. (H411)

Identity of the substances primarily responsible for the major health hazards

Naphtha (petroleum), hydrodesulfurized light, dearomatized. Index-no.: 649-383-00-1

Safety statement(s)	General	Keep out of reach of children. (P102) If medical advice is needed, have product container or label at hand. (P101)
	Prevention	Avoid release to the environment. (P273)
	Response	In case of fire: Use alcohol-resistant foam or powder for extinction. (P370+P378) IF SWALLOWED: Do NOT induce vomiting. Get immediate medical advice/attention. (P301+P331+P315)
	Storage	-
	Disposal	-

2.3. Other hazards

This product contains an organic solvent. Repeated exposure to organic solvents can result in damage to the nervous system and inner organs, such as the liver and kidneys.

Additional labelling

-

Additional warnings

Tactile warning.

VOC

-

DPD/DSD Classification

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.(R51/53).
Harmful: may cause lung damage if swallowed.(R65). Extremely flammable.(R12).

SECTION 3: Composition/information on ingredients

3.1/3.2. Substances

NAME:	Naphtha (petroleum), hydrodesulfurized light, dearomatized
IDENTIFICATION NOS.:	CAS-no: 92045-53-9 EC-no: 295-434-2 Index-no: 649-383-00-1
CONTENT:	95-100%
DSD CLASSIFICATION:	F;R11 Xn;R65 N;R51/53
CLP CLASSIFICATION:	Flam. Liq. 2, Asp. Tox. 1, Aquatic Chronic 2 H225, H304, H411
NOTE:	S

(*) See full text of H/R-phrases in chapter 16. Occupational limits are listed in section 8, if these are available.
S = Organic solvent

Other informations

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet. The doctor can contact the Work Environment Medical Clinic at Bispebjerg Hospital, tlf. 35 31 60 60 Contact a doctor, if in doubt about the injured person's condition or if the symptoms continue. Never give an unconscious person water or similar.

Inhalation

Get the person into fresh air and stay with them.

Skin contact

Remove contaminated clothing and shoes at once. Skin that has come in contact with the material must be washed thoroughly with water and soap. Skin cleanser can be used. DO NOT use solvents or thinners.

Eye contact

Remove contact lenses. Flush eyes immediately with plenty of water (20-30°C) for at least 15 minutes and continue until irritation stops. Make sure you flush under the upper and lower eyelids. If irritation continues, contact a doctor.

Ingestion

Do not induce vomiting! If vomiting occurs, keep head facing down so that vomit does not get into the lungs. Call a doctor or ambulance. Symptoms of chemical pneumonia can appear after several hours. People who have swallowed the product should therefore be kept under medical attention for at least 48 hours.

Burns

Rinse with water until the pain stops and continue for 30 minutes.

4.2. Most important symptoms and effects, both acute and delayed

This product contains substances that can give chemical pneumonia if inhaled. The symptoms of chemical pneumonia can appear after several hours.
Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin's natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.

4.3. Indication of any immediate medical attention and special treatment needed

IF exposed or concerned:
Get immediate medical advice/attention.

Information to medics

Bring this safety data sheet.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Recommended: alcohol-resistant foam, carbonic acid, powder, water mist. Water jets should not be used, since they can spread the fire.

5.2. Special hazards arising from the substance or mixture

No special

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid inhalation of vapours from waste material. Avoid direct contact with spilled substances. Stores that have not ignited must be cooled by water mist. Where possible, remove flammable materials. Make sure there is sufficient ventilation.

6.2. Environmental precautions

Consider putting up waste collecting trays/basins to prevent leakage to the surroundings. Avoid discharge to lakes, streams, sewers, etc. In the event of a leakage to the surroundings, contact the local environmental authorities.

6.3. Methods and material for containment and cleaning up

Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations. Cleaning should be done as far as possible using normal cleaning agents. Solvents should be avoided. Use sand, sawdust, earth, vermiculite, diatomaceous earth to contain and collect non-combustible absorbent materials and place in container for disposal, according to local regulations.

6.4. Reference to other sections

See section on “Disposal” with regard to the handling of waste. See section on 'Exposure controls/personal protection' for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Smoking, consumption of food or liquid, and storage of tobacco, food or liquids are not allowed in the workrooms. Consider putting up waste collecting trays/basins to prevent leakage to the surroundings. See section on 'Exposure controls/personal protection' for information on personal protection. Avoid direct contact with the product.

7.2. Conditions for safe storage, including any incompatibilities

Always store in containers of the same material as the original. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Must be stored in a cool and ventilated area, away from possible sources of combustion.

Storage temperature

Frost free

7.3. Specific end use(s)

This product should only be used for applications described in Section 1.2

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

OEL

No data available

DNEL / PNEC

No data available.

8.2. Exposure controls

No control is necessary if the product is used in a normal way.

General recommendations

Smoking, consumption of food or liquid, and storage of tobacco, food or liquid, are not allowed in the workroom.

Exposure scenarios

If there is an appendix to this safety data sheet, the indicated exposure scenarios must be complied.

Exposure limits

There are no maximum exposure limits for the substances contained in this product.

Appropriate technical measures

Take ordinary precautions when using the product. Avoid inhalation of gas or dust.

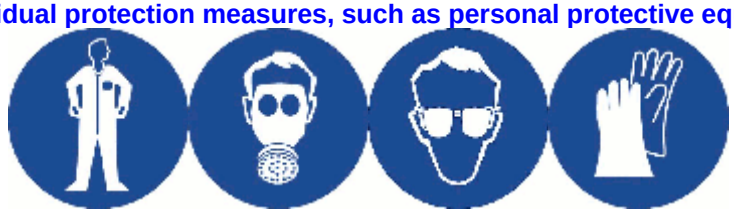
Hygiene measures

Whenever you take a break in using this product and when you have finished using it, all exposed areas of the body must be washed. Always wash hands, forearms and face.

Measures to avoid environmental exposure

Keep damming materials near the workplace. If possible collect spillage during work.

Individual protection measures, such as personal protective equipment



Generally

Only CE-marked personal protection equipment should be used.

Respiratory Equipment

If the ventilation at the work place is not sufficient, use a half or whole mask with an appropriate filter or an air-supplied respiratory protector. The choice depends on the concrete work situation and how long you will be using the product.

Skin protection

Special work clothing should be used. When working with this product for a long period of time, use a protective suit.

Hand protection

Recommended: Nitrile rubber. . Breakthrough time: See the manufacturer's instructions

Eye protection

Use face shield. Use safety glasses with a side shield as an alternative.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	Colour	Odour	pH	Viscosity	Density (g/cm3)
Liquid	Colourless	Gasoline-like	-	-	0,72

Phase changes

Melting point (°C)	Boiling point (°C)	Vapour pressure (mm Hg)
-60	97	-

Data on fire and explosion hazards

Flashpoint (°C)	Ignition (°C)	Self ignition (°C)
-4	-	200

Explosion limits (Vol %)	Oxidizing properties
-	-

Solubility

Solubility in water	n-octanol/water coefficient
Insoluble	-

9.2. Other information

Solubility in fat	Additional information
-	N/A

SECTION 10: Stability and reactivity

10.1. Reactivity
No data available

10.2. Chemical stability
The product is stable under the conditions, noted in the section on “Handling and storage”.

10.3. Possibility of hazardous reactions
No special

10.4. Conditions to avoid
Avoid static electricity. Do not expose to heat (e.g. sunlight), because it can lead to excess pressure.

10.5. Incompatible materials
Strong acids, strong bases, strong oxidising agents, and strong catabolic agents.

10.6. Hazardous decomposition products
The product is not degraded when used as specified in section 1.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Substance	Species	Test	Route of exposure	Result

No data available.

Long term effects

This product contains substances that can give chemical pneumonia if inhaled. The symptoms of chemical pneumonia can appear after several hours.
Neurotoxic effect: This product contains organic solvents, which can have an effect on the nervous system. Symptoms of neurotoxicity can be: loss of appetite, headache, dizziness, whistling in the ears, tingling sensations in the skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc.
Repeated exposure to solvents can result in the breaking down of the skin's natural fat layer. The skin will then be more prone to absorb dangerous substances, e.g. allergens.

SECTION 12: Ecological information

12.1. Toxicity

Substance	Species	Test	Test duration	Result

No data available.

12.2. Persistence and degradability

Substance	Biodegradability	Test	Result

No data available.

12.3. Bioaccumulative potential

Substance	Potential bioaccumulation	LogPow	BFC

No data available.

12.4. Mobility in soil

No data available

12.5. Results of PBT and vPvB assessment

No data available

12.6. Other adverse effects

This product contains ecotoxic substances which can have damaging effects on water-organisms. This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

The product is covered by the regulations on dangerous waste.

Waste

EWC code

20 01 13

Specific labelling

-

Contaminated packing

Packaging which contains leftovers from the product must be disposed of in the same way as the product.

SECTION 14: Transport information

This product is covered by the conventions on dangerous goods.

14.1 – 14.4

ADR/RID	UN number	UN proper shipping name	Transport hazard class(es)	Packing group	Notes
	1268	PETROLEUM DISTILLATES, N.O.S. (Naphtha (petroleum), hydrodesulfurized light, dearomatized)	3	II	-

IMDG	UN-no.	Proper Shipping Name	Class	PG*	EmS	MP**	Hazardous constituent
	1268	PETROLEUM DISTILLATES, N.O.S. (Naphtha (petroleum), hydrodesulfurized light, dearomatized)	3	II	F-E, S-E	-	-

14.5. Environmental hazards

This product contains substances which can cause undesirable long-term effects in the water environment, due to its poor biodegradability.

14.6. Special precautions for user

-

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

(*) Packing group

(**) Marine pollutant

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Restrictions for application

People under the age of 18 must not be exposed to this product cf. Council Directive 94/33/EC. For exceptions, see the Danish Working Environment Authority's Executive Order No. 239 of 6 April 2005.

Demands for specific education

-

15.2. Chemical safety assessment

No

SECTION 16: Other information

Sources

EC regulation 1907/2006 (REACH)
Directive 2000/532/EC
EC Regulation 1272/2008 (CLP)

Full text of H/R-phrases as mentioned in section 3

R11 - Highly flammable.
R65 - Harmful: may cause lung damage if swallowed.
R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
H225 - Highly flammable liquid and vapour.
H304 - May be fatal if swallowed and enters airways.
H411 - Toxic to aquatic life with long lasting effects.

The full text of identified uses as mentioned in section 1

-

Other symbols mentioned in section 2

-

Other

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
A change (in proportion to the last essential change (first cipher in SDS version)) is marked with a blue triangle.

The safety data sheet is validated by

TS

Date of last essential change (First cipher in SDS version)

-

Date of last minor change (Last cipher in SDS version)

-

ROCOL RTD METALCUTTING LIQUID

Chemwatch Material Safety Data Sheet
Issue Date: 26-Jul-2013
X9317SP

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
ROCOL RTD METALCUTTING LIQUID

SYNONYMS
"metal cutting lubricant"

PRODUCT USE
Metal cutting lubricant.

SUPPLIER

Company: ITW POLYMERS AND FLUIDS	Company: ITW Polymers & Fluids
Address:	Address:
100 Hassall Street	100 Hassall Street
Wetherill Park	Wetherill Park
NSW 2164	NSW, 2164
Australia	Australia
Telephone: +61 2 9757 8800	Telephone: +61 2 9757 8800
Emergency Tel: 1800 039 008	Emergency Tel: 1800 039 008
Emergency Tel: +61 3 9573 3112	Emergency Tel: +61 3 9573 3112
Fax: +61 2 9757 3855	Fax: +61 2 9757 3855

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE
NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS. According to NOHSC Criteria, and ADG Code.

RISK
•None under normal operating conditions.

SAFETY
•None under normal operating conditions.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
chlorinated waxes		>60
sulfurised oil		10-30

NOTE: Manufacturer has supplied full ingredient information to allow CHEMWATCH assessment.

Section 4 - FIRST AID MEASURES

SWALLOWED
• If swallowed do NOT induce vomiting.
• If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

continued...

• Observe the patient carefully.
• Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.

EYE
■ If this product comes in contact with the eyes:
• Wash out immediately with fresh running water.
• Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
• Seek medical attention without delay; if pain persists or recurs seek medical attention.
• Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN
■ If skin contact occurs:
• Immediately remove all contaminated clothing, including footwear.
• Flush skin and hair with running water (and soap if available).
• Seek medical attention in event of irritation.

INHALED
• If fumes or combustion products are inhaled remove from contaminated area.
• Lay patient down. Keep warm and rested.
• Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
• Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

NOTES TO PHYSICIAN
Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
• Foam.
• Dry chemical powder.
• BCF (where regulations permit).
• Carbon dioxide.

FIRE FIGHTING
• Alert Fire Brigade and tell them location and nature of hazard.
• Wear breathing apparatus plus protective gloves.
• Prevent, by any means available, spillage from entering drains or water course.
• Use water delivered as a fine spray to control fire and cool adjacent area.

FIRE/EXPLOSION HAZARD
• Combustible.
• Slight fire hazard when exposed to heat or flame.
• Heating may cause expansion or decomposition leading to violent rupture of containers.
• On combustion, may emit toxic fumes of carbon monoxide (CO).
Other combustion products include: carbon dioxide (CO_2), sulfur oxides (SOx), chlorine, hydrogen chloride and hydrogen sulfide (H_2S).

FIRE INCOMPATIBILITY
■ Avoid contamination with strong oxidising agents as ignition may result.

HAZCHEM
None

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
Slippery when spilt.
• Remove all ignition sources.
• Clean up all spills immediately.
• Avoid breathing vapours and contact with skin and eyes.
• Control personal contact with the substance, by using protective equipment.

continued...

MAJOR SPILLS
Remove all ignition sources.
Slippery when spilt.
Minor hazard.
• Clear area of personnel.
• Alert Fire Brigade and tell them location and nature of hazard.
• Control personal contact with the substance, by using protective equipment as required.
• Prevent spillage from entering drains or water ways.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
• Avoid smoking, naked lights or ignition sources.
• Limit all unnecessary personal contact.
• Wear protective clothing when risk of exposure occurs.
• Use in a well-ventilated area.
• Avoid contact with incompatible materials.

SUITABLE CONTAINER
• Metal can or drum
• Packaging as recommended by manufacturer.
• Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY
Avoid storage with oxidisers.

STORAGE REQUIREMENTS
• Store in original containers.
• Keep containers securely sealed.
• No smoking, naked lights or ignition sources.
• Store in a cool, dry, well-ventilated area.
• DO NOT allow product to freeze.
DO NOT store above 50 deg. C.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

MATERIAL DATA
ROCOL RTD METALCUTTING LIQUID:
None assigned.

PERSONAL PROTECTION

EYE
• Safety glasses with side shields; or as required,
• Chemical goggles.
• Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].

HANDS/FEET
■ Wear chemical protective gloves, e.g. PVC.
Wear safety footwear.

continued...

OTHER
• Overalls.
• Eyewash unit.

ENGINEERING CONTROLS
■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE
Dark brown liquid; does not mix with water.

PHYSICAL PROPERTIES
Liquid.
Does not mix with water.
Sinks in water.

State	Liquid	Molecular Weight	Not applicable.
Melting Range (°C)	Not applicable.	Viscosity	Not available
Boiling Range (°C)	Not available.	Solubility in water (g/L)	Immiscible
Flash Point (°C)	>150	pH (1% solution)	Not applicable
Decomposition Temp (°C)	Not available.	pH (as supplied)	Not applicable
Autoignition Temp (°C)	Not available.	Vapour Pressure (kPa)	Not available
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	1.16
Lower Explosive Limit (%)	Not applicable	Relative Vapour Density (air=1)	Not available
Volatile Component (%vol)	Not available	Evaporation Rate	Not available

Section 10 - STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY
• Presence of incompatible materials.
• Product is considered stable.
• Hazardous polymerisation will not occur.
For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
■ The liquid is discomforting to the gastro-intestinal tract.
Ingestion may result in nausea, abdominal irritation, pain and vomiting.
Considered an unlikely route of entry in commercial/industrial environments.

EYE
■ The liquid is discomforting to the eyes and capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/ or other transient eye damage/ ulceration.

SKIN
■ The liquid may be miscible with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis. The material is unlikely to produce an irritant dermatitis as described in EC Directives .

continued...

INHALED
■ Not normally a hazard due to non-volatile nature of product.
The vapour from heated material is discomforting and may be harmful.

CHRONIC HEALTH EFFECTS
■ Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

TOXICITY AND IRRITATION
No data for this material.

Section 12 - ECOLOGICAL INFORMATION

No data

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
Rocol RTD Metalcutting Liquid	No Data Available	No Data Available	No Data Available	No Data Available

Section 13 - DISPOSAL CONSIDERATIONS

• Recycle wherever possible or consult manufacturer for recycling options.
• Consult State Land Waste Authority for disposal.
• Bury or incinerate residue at an approved site.
• Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM:
None (ADG7)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: ADG7, IATA, IMDG

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE
None

REGULATIONS

No data for Rocol RTD Metalcutting Liquid (CW: 12253)

Section 16 - OTHER INFORMATION

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

continued...

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Issue Date: 26-Jul-2013
Print Date: 12-Sep-2013

This is the end of the MSDS.

SAFETY DATA SHEET

RTD COMPOUND

Compilation date: 22/05/2014

Revision date: 13/11/2015

Revision No: 12

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: RTD COMPOUND

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of substance / mixture: Lubricant for reaming, tapping and drilling.

1.3. Details of the supplier of the safety data sheet

Company name: ROCOL

ROCOL House

Swillington

Leeds

West Yorkshire

LS26 8BS

ENGLAND

Tel: +44 (0) 113 232 2700

Fax: +44 (0) 113 232 2740

Email: customer-service rocol.com

1.4. Emergency telephone number

Emergency tel: +44 (0) 113 232 2600

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Lact.: H362; Aquatic Acute 1: H400; Aquatic Chronic 1: H410; -: EUH066; -: EUH208

Most important adverse effects: Repeated exposure may cause skin dryness or cracking. Contains pine oil. May produce an allergic reaction. May cause harm to breast-fed children. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

2.2. Label elements

Label elements:

Hazard statements: EUH066: Repeated exposure may cause skin dryness or cracking.

EUH208: Contains pine oil. May produce an allergic reaction.

H362: May cause harm to breast-fed children.

H400: Very toxic to aquatic life.

H410: Very toxic to aquatic life with long lasting effects.

Hazard pictograms: GHS09: Environmental

[cont...]

Signal words: Warning

Precautionary statements: P260: Do not breathe dust/fumes/gas/mist/vapours/spray.
P263: Avoid contact during pregnancy.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P273: Avoid release to the environment.
P308+313: IF exposed or concerned: Get medical advice/attention.
P391: Collect spillage.
P501: Dispose of contents/container to local/national regulations.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

Hazardous ingredients:

C14-C17 CHLORINATED PARAFFIN - REACH registered number(s): 01-2119519269-33-

EINECS	CAS	PBT / WEL	CLP Classification	Percent
287-477-0	85535-85-9	-	Lact.: H362; Aquatic Chronic 1: H410; Aquatic Acute 1: H400; -: EUH066	50-70%

PINE OIL

304-455-9	94266-48-5	-	Flam. Liq. 3: H226; Aquatic Chronic 2: H411; Eye Irrit. 2: H319; Skin Irrit. 2: H315; Skin Sens. 1: H317	1%

Contains: Mineral oil contains 3% (w/w) DMSO extractable according to IP346

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Wash immediately with plenty of soap and water.

Eye contact: Bathe the eye with running water for 15 minutes.

Ingestion: Wash out mouth with water.

Inhalation: Remove casualty from exposure ensuring one s own safety whilst doing so.

4.2. Most important symptoms and effects, both acute and delayed

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: There may be irritation of the throat with a feeling of tightness in the chest.

Delayed / immediate effects: No data available.

[cont...]

4.3. Indication of any immediate medical attention and special treatment needed

Immediate / special treatment: Not applicable.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Suitable extinguishing media for the surrounding fire should be used.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Mark out the contaminated area with signs and prevent access to unauthorised personnel.

6.2. Environmental precautions

Environmental precautions: Do not discharge into drains or rivers.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Transfer to a closable, labelled salvage container for disposal by an appropriate method.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Avoid direct contact with the substance.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed.

Suitable packaging: Must only be kept in original packaging.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

[cont...]

Hazardous ingredients:

PINE OIL

Workplace exposure limits: **Respirable dust**

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	100 ppm, 566 mg/m3	150 ppm, 850 mg/m3	-	-

DNEL/PNEC Values

DNEL / PNEC No data available.

8.2. Exposure controls

Engineering measures: Ensure there is sufficient ventilation of the area.
Respiratory protection: Respiratory protective device with particle filter.
Hand protection: Protective gloves.
Eye protection: Safety glasses. Ensure eye bath is to hand.
Skin protection: Protective clothing.
Environmental: No special requirement.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Paste
Colour: Brown
Odour: Characteristic odour
Evaporation rate: Negligible
Oxidising: Non-oxidising (by EC criteria)
Solubility in water: Insoluble
Viscosity: No data available.
Boiling point/range°C: No data available.
Melting point/range°C: No data available.
Flammability limits %: lower: No data available.
upper: No data available.
Flash point°C: >100
Part.coeff. n-octanol/water: No data available.
Autoflammability°C: >200
Vapour pressure: No data available.
Relative density: 1.17
pH: No data available.
VOC g/l: No data available.

9.2. Other information

Other information: No data available.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

[cont...]

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.
Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes.

Section 11: Toxicological information

11.1. Information on toxicological effects

Hazardous ingredients:

C14-C17 CHLORINATED PARAFFIN

ORAL	RAT	LD50	> 2000	mg/kg

PINE OIL

DERMAL	RBT	LD50	> 5000	mg/kg
ORAL	RAT	LD50	> 3200	mg/kg

Toxicity values: No data available.

Symptoms / routes of exposure

Skin contact: There may be mild irritation at the site of contact.

Eye contact: There may be irritation and redness.

Ingestion: There may be irritation of the throat.

Inhalation: There may be irritation of the throat with a feeling of tightness in the chest.

Delayed / immediate effects: No data available.

Other information: May cause harm to breastfed babies.

Section 12: Ecological information

12.1. Toxicity

[cont...]

Ecotoxicity values:

Species	Test	Value	Units
Daphnia magna	48H EC50	0.006	mg/l
FISH	96H LC50	>5000	mg/l
ALGAE	96H ErC50	>3.2	mg/l

Hazardous ingredients:

C14-C17 CHLORINATED PARAFFIN

ALGAE	96H ErC50	>3.2	mg/l
Daphnia magna	48H EC50	0.006	mg/l
FISH	96H LC50	>5000	mg/l

PINE OIL

ALGAE	96H ErC50	> 1.81	mg/l
FISH	96H LC50	0.221	mg/l

12.2. Persistence and degradability

Persistence and degradability: Not biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: Bioaccumulation potential.

12.4. Mobility in soil

Mobility: Non-volatile. Absorbed only slowly into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: Toxic to aquatic organisms. Toxic to soil organisms.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Transfer to a suitable container and arrange for collection by specialised disposal company.

Recovery operations: No data available

Waste code number: 12 01 99

Disposal of packaging: Dispose of in a regulated landfill site or other method for hazardous or toxic wastes.

NB: The user s attention is drawn to the possible existence of regional or national regulations regarding disposal.

[cont...]

Section 14: Transport information

14.1. UN number

UN number: UN3077

14.2. UN proper shipping name

Shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S
(C14-C17 CHLORINATED PARAFFIN)

14.3. Transport hazard class(es)

Transport class: 9

14.4. Packing group

Packing group: III

14.5. Environmental hazards

Environmentally hazardous: Yes **Marine pollutant:** Yes

14.6. Special precautions for user

Special precautions: No special precautions.
Tunnel code: E
Transport category: 3

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Transport in bulk: No data available.

Section 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Specific regulations: Not applicable.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

Section 16: Other information

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 2015/830.

Phrases used in s.2 and s.3: EUH066: Repeated exposure may cause skin dryness or cracking.
EUH208: Contains name of sensitising substance>. May produce an allergic reaction.
H226: Flammable liquid and vapour.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.

[cont...]

H362: May cause harm to breast-fed children.

H400: Very toxic to aquatic life.

H410: Very toxic to aquatic life with long lasting effects.

H411: Toxic to aquatic life with long lasting effects.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

SECTION 1. IDENTIFICATION

Product name : Shell Tellus S4 V 32

Product code : 001D7769

Manufacturer or supplier's details

Manufacturer/Supplier : **Shell Oil Products US**
P.O. Box 4427
Houston T 77210-4427
USA

SDS Request : (+1) 877-276-7285

Customer Service :

Emergency telephone number

Spill Information : 877-504-9351

Health Information : 877-242-7400

Recommended use of the chemical and restrictions on use

Recommended use : Hydraulic oil

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Inhalation) : Category 4

Skin irritation : Category 2

Chronic aquatic toxicity : Category 2

GHS Label element

Hazard pictograms :

Signal word : Warning

Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS criteria.
HEALTH HAZARDS:
H332 Harmful if inhaled.
H315 Causes skin irritation.
ENVIRONMENTAL HAZARDS:
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P312 Call a POISON CENTER/doctor if you feel unwell.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
Storage:
No precautionary phrases.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Hazardous components which must be listed on the label:
Contains Gas oils (petroleum), hydrodesulphurised.

Other hazards which do not result in classification
Used oil may contain harmful impurities.
High-pressure injection under the skin may cause serious damage including local necrosis.
Not classified as flammable but will burn.

The classification of this material is based on OSHA HCS 2012 criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Highly refined mineral oils and additives.
The highly refined mineral oil contains 3% (w/w) DMSO-extract, according to IP346.

Hazardous components

Chemical Name	Synonyms	CAS-No.	Concentration (%)
Gas oils (petroleum), hydrodesulfurized	Gas oils (petroleum), hydrodesulfurized	64742-79-6	70 - 80

SECTION 4. FIRST-AID MEASURES

If inhaled : Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

In case of skin contact : Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes, and follow by washing with soap and water if available. If redness, swelling, pain and/or blisters occur, transport to the nearest medical facility for additional treatment.

When using high pressure equipment, injection of product under the skin can occur. If high pressure injuries occur, the casualty should be sent immediately to a hospital. Do not wait for symptoms to develop.
Obtain medical attention even in the absence of apparent wounds.

In case of eye contact	:	Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
If swallowed	:	If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3°C), shortness of breath, chest congestion or continued coughing or wheezing.
Most important symptoms and effects, both acute and delayed	:	If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. The onset of respiratory symptoms may be delayed for several hours after exposure. Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters. Defatting dermatitis signs and symptoms may include a burning sensation and/or a dried/cracked appearance. Ingestion may result in nausea, vomiting and/or diarrhoea. Local necrosis is evidenced by delayed onset of pain and tissue damage a few hours following injection.
Protection of first-aiders	:	When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
Immediate medical attention, special treatment	:	Treat symptomatically. Call a doctor or poison control center for guidance. High pressure injection injuries require prompt surgical intervention an d possibly steroid therapy, to minimise tissue damage and loss of function. Because entry wounds are small and do not reflect the seriousness of the underlying damage, surgical exploration to determine the extent of involvement may be necessary. Local anaesthetics or hot soaks should be avoided because they can contribute to swelling, vasospasm and ischaemia. Prompt surgical decompression, debridement and evacuation of foreign material should be performed under general anaesthetics, and wide exploration is essential.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	:	Do not use water in a jet.
Specific hazards during fire-fighting	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide may be evolved if incomplete combustion

occurs.
Unidentified organic and inorganic compounds.

Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Special protective equipment for firefighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter s clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Avoid contact with skin and eyes.
Environmental precautions	:	Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.
Additional advice	:	For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.

SECTION 7. HANDLING AND STORAGE

Technical measures	:	Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Precautions for safe handling	:	Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used.

Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

Avoidance of contact : Strong oxidising agents.

Product Transfer : This material has the potential to be a static accumulator. Proper grounding and bonding procedures should be used during all bulk transfer operations.

Storage

Other data : Keep container tightly closed and in a cool, well-ventilated place.
Use properly labeled and closable containers.
Must be stored in a diked (bunded) area.

Store at ambient temperature.

Packaging material : Suitable material: For containers or container linings, use mild steel or high density polyethylene.
Unsuitable material: PVC.

Container Advice : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Oil mist, mineral	Not Assigned	TWA ((inhalable fraction))	5 mg/m3	US. ACGIH Threshold Limit Values
		(Mist)	5 mg/m3	OSHA TRANS

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut f r Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany

http://www.dguv.de/inhalt/index.jsp
L Institut National de Recherche et de Securit , (INRS), France http://www.inrs.fr/accueil

Engineering measures : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
Adequate ventilation to control airborne concentrations.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

General Information:
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.

Personal protective equipment

Respiratory protection : No respiratory protection is ordinarily required under normal conditions of use.
In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
Select a filter suitable for the combination of organic gases and vapours [Type A/Type P boiling point >65°C (149°F)].

Hand protection
Remarks : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. PVC, neoprene or nitrile rubber gloves Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.

Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model.

Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.

Skin and body protection : Wear chemical resistant gloves/gauntlets and boots. Where risk of splashing, also wear an apron.

Protective measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Environmental exposure controls

General advice : Take appropriate measures to fulfill the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water.
Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid at room temperature.
Colour	:	colourless
Odour	:	Slight hydrocarbon
Odour Threshold	:	Data not available
pH	:	Not applicable
pour point	:	-60 °C / -76 °FMethod: ISO 3016
Initial boiling point and boiling range	:	> 280 °C / 536 °Festimated value(s)

Flash point	:	>= 100 °C / 212 °F Method: ISO 2592
Evaporation rate	:	Data not available
Flammability (solid, gas)	:	Data not available
Upper explosion limit	:	Typical 10 %(V)
Lower explosion limit	:	Typical 1 %(V)
Vapour pressure	:	0.5 Pa (20 °C / 68 °F) estimated value(s)
Relative vapour density	:	> 1estimated value(s)
Relative density	:	0.866 (15 °C / 59 °F)
Density	:	866 kg/m3 (15.0 °C / 59.0 °F) Method: ISO 12185
Solubility(ies)		
Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	Pow: > 6(based on information on similar products)
Auto-ignition temperature	:	> 320 °C / 608 °F
Viscosity		
Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	33.8 mm2/s (40.0 °C / 104.0 °F) Method: ASTM D445
		9.93 mm2/s (100 °C / 212 °F) Method: ASTM D445
Conductivity	:	This material is not expected to be a static accumulator.
Decomposition temperature	:	Data not available

SECTION 10. STABILITY AND REACTIVITY

Chemical stability	:	Stable.
Possibility of hazardous reac-	:	Reacts with strong oxidising agents.

tions

Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Strong oxidising agents.
Hazardous decomposition products	:	Hazardous decomposition products are not expected to form during normal storage.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on data on the components and the toxicology of similar products.Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Information on likely routes of exposure
Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (rat): > 5,000 mg/kg Remarks: Expected to be of low toxicity:
Acute inhalation toxicity	:	LC 50 (Rat): > 1 - 5 mg/l Exposure time: 4 h Remarks: Harmful if inhaled.
Acute dermal toxicity	:	LD 50 (Rabbit): > 2,000 - 5,000 mg/kg Remarks: May be harmful in contact with skin.

Skin corrosion/irritation

Product:
Remarks: Causes skin irritation.

Serious eye damage/eye irritation

Product:
Remarks: Expected to be slightly irritating.

Respiratory or skin sensitisation

Product:
Remarks: Not expected to be a skin sensitiser.

Germ cell mutagenicity

Product:

: Remarks: Not considered a mutagenic hazard.

Carcinogenicity

Product:
Remarks: Not expected to be carcinogenic.

Remarks: Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies., Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC).

IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Product:

:
Remarks: Not expected to impair fertility., Not expected to be a developmental toxicant.

STOT - single exposure

Product:
Remarks: Not expected to be a hazard.

STOT - repeated exposure

Product:
Remarks: Not expected to be a hazard.

Aspiration toxicity

Product:
Not considered an aspiration hazard.

Further information

Product:
Remarks: Used oils may contain harmful impurities that have accumulated during use. The con-

centration of such impurities will depend on use and they may present risks to health and the environment on disposal., ALL used oil should be handled with caution and skin contact avoided as far as possible.

Remarks: High pressure injection of product into the skin may lead to local necrosis if the product is not surgically removed.

Remarks: Slightly irritating to respiratory system.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment	:	Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).(LL/EL/IL50 expressed as the nominal amount of product required to prepare aqueous test extract).

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity)	:	Remarks: Expected to be toxic: LL/EL/IL50 > 1 = 10 mg/l
Toxicity to daphnia and other aquatic invertebrates (Acute toxicity)	:	Remarks: Expected to be toxic: LL/EL/IL50 > 1 = 10 mg/l
Toxicity to algae (Acute toxicity)	:	Remarks: Expected to be toxic: LL/EL/IL50 > 1 = 10 mg/l
Toxicity to fish (Chronic toxicity)	:	Remarks: Data not available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: Data not available
Toxicity to bacteria (Acute toxicity)	:	Remarks: Data not available

Persistence and degradability

Product:

Biodegradability	:	Remarks: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but contains components that may persist in the environment.

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Contains constituents with the potential to bioaccumulate.

Mobility in soil

Product:

Mobility : Remarks: Liquid under most environmental conditions.
If it enters soil, it will adsorb to soil particles and will not be mobile.

Remarks: Floats on water.

Other adverse effects

no data available

Product:

Additional ecological information : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.
Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

Poorly soluble mixture.
May cause physical fouling of aquatic organisms.

Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Do not dispose into the environment, in drains or in water courses

Contaminated packaging : Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.
Disposal should be in accordance with applicable regional, national, and local laws and regulations.

Local legislation
Remarks : Disposal should be in accordance with applicable regional, national, and local laws and regulations.

SECTION 14. TRANSPORT INFORMATION

National Regulations

US Department of Transportation Classification (49 CFR Parts 171-180)

Not regulated as a dangerous good

International Regulation

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Gas oils, (petroleum), hydrodesulphurised)
Class	:	9
Packing group	:	III
Labels	:	9MI

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Gas oils, (petroleum), hydrodesulphurised)
Class	:	9
Packing group	:	III
Labels	:	9
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollution category	:	Not applicable
Ship type	:	Not applicable
Product name	:	Not applicable
Special precautions	:	Not applicable

Special precautions for user

Remarks	:	Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

Additional Information **:** MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15. REGULATORY INFORMATION

OSHA Hazards : Toxic
Irritant

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Cumene	98-82-8	5000	

: Calculated RQ exceeds reasonably attainable upper limit.

CERCLA Reportable Quantity

Calculated RQ exceeds reasonably attainable upper limit., Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA., The components with RQs are given for information.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : Immediate (Acute) Health Hazard

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Water Act

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

ylene, mixed isomers	1330-20-7	0.0001 %
Naphthalene	91-20-3	0.0001 %

Pennsylvania Right To Know

Distillates (petroleum), solvent-refined heavy paraffinic	64741-88-4

California Prop 65 WARNING This product contains a chemical known to the State of California to cause cancer.

The components of this product are reported in the following inventories:

EINECS : All components listed or polymer exempt.

TSCA : All components listed.

DSL : All components listed.

SECTION 16. OTHER INFORMATION

Further information

NFPA Rating (Health, Fire, Reactivity) 1, 1, 0

Due to the conversion of this product to GHS classification and labelling, there has been a significant change to the nature of the information presented in chapter 2.
A vertical bar ( ) in the left margin indicates an amendment from the previous version.

Abbreviations and Acronyms : The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial

Hygienists
ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS = Australian Inventory of Chemical Substances
ASTM = American Society for Testing and Materials
BEL = Biological exposure limits
BTE = Benzene, Toluene, Ethylbenzene, ylenes
CAS = Chemical Abstracts Service
CEFIC = European Chemical Industry Council
CLP = Classification Packaging and Labelling
COC = Cleveland Open-Cup
DIN = Deutsches Institut fur Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals
ECHA = European Chemicals Agency
EINECS = The European Inventory of Existing Commercial Chemical Substances
EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty
IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty
MARPOL = International Convention for the Prevention of Pollution From Ships
NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level
OE HPV = Occupational Exposure - High Production Volume
PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of Chemicals
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail
SKIN DES = Skin Designation
STEL = Short term exposure limit

TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

Revision Date : 05/12/2015

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Material Safety Data Sheet

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : **Shell Tivela Oil S 320**
Product Code : 001A9648
Uses : Gear lubricant.

Manufacturer/Supplier : **Shell Oil Products US**
P.O. Box 4427
Houston T 77210-4427
USA
SDS Request : (+1) 877-276-7285

Emergency Telephone Number
Spill Information : 877-242-7400
Health Information : 877-504-9351

2. COMPOSITION/INFORMATION ON INGREDIENTS

Blend of polyalkylene glycol and additives.

3. HAZARDS IDENTIFICATION

Emergency Overview

Appearance and Odour : Clear colourless. Liquid at room temperature. Slight hydrocarbon.

Health Hazards : Not classified as dangerous for supply or conveyance.
Safety Hazards : Not classified as flammable but will burn.
Environmental Hazards : Not classified as dangerous for the environment.

Health Hazards : Not expected to be a health hazard when used under normal conditions.

Health Hazards
Inhalation : Under normal conditions of use, this is not expected to be a primary route of exposure.
Skin Contact : Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Contact : May cause slight irritation to eyes.
Ingestion : Low toxicity if swallowed.
Other Information : Used oil may contain harmful impurities.
Signs and Symptoms : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas. Ingestion may result in nausea, vomiting and/or diarrhoea.
Aggravated Medical Conditions : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Skin.

Environmental Hazards	:	Not classified as dangerous for the environment.
Additional Information	:	Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

4. FIRST-AID MEASURES

General Information	:	Not expected to be a health hazard when used under normal conditions.
Inhalation	:	No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
Skin Contact	:	Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
Eye Contact	:	Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.
Ingestion	:	In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.
Advice to Physician	:	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point	:	Typical 286 °C / 547 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V)
Auto ignition temperature	:	> 320 °C / 608 °F
Specific Hazards	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide may be evolved if incomplete combustion occurs. Unidentified organic and inorganic compounds.
Suitable Extinguishing Media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable Extinguishing Media	:	Do not use water in a jet.
Protective Equipment for Firefighters	:	Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. See Chapter 13 for information on disposal. Observe the relevant local and international regulations.

Protective measures	:	Avoid contact with skin and eyes. Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or

other appropriate barriers.

Clean Up Methods	:	Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.
Additional Advice	:	Local authorities should be advised if significant spillages cannot be contained.

7. HANDLING AND STORAGE

General Precautions	:	Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Handling	:	Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Storage	:	Keep container tightly closed and in a cool, well-ventilated place. Use properly labelled and closeable containers. Store at ambient temperature.
Recommended Materials	:	For containers or container linings, use mild steel or high density polyethylene.
Unsuitable Materials	:	PVC.
Additional Information	:	Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Biological Exposure Index (BEI)
No biological limit allocated.

Exposure Controls	:	The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate ventilation to control airborne concentrations. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated. Define procedures for safe handling and maintenance of controls. Educate and train workers in the hazards and control measures relevant to normal activities associated with this product. Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g.

personal protective equipment, local exhaust ventilation. Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle. Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

Personal Protective Equipment : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory Protection : No respiratory protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material. If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. Select a filter suitable for combined particulate/organic gases and vapours [boiling point >65°C(149 °F)].

Hand Protection : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection: PVC, neoprene or nitrile rubber gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognise that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time may be acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model.

Eye Protection : Wear safety glasses or full face shield if splashes are likely to occur.

Protective Clothing : Skin protection not ordinarily required beyond standard issue work clothes.

Monitoring Methods	:	Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory. Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/ Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/ Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/ Institut f r Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA), Germany. http://www.dguv.de/inhalt/index.jsp L Institut National de Recherche et de Securit , (INRS), France http://www.inrs.fr/accueil
Environmental Exposure Controls	:	Take appropriate measures to fulfil the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water. Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Clear colourless. Liquid at room temperature.
Odour	:	Slight hydrocarbon.
pH	:	Not applicable.
Initial Boiling Point and Boiling Range	:	> 280 °C / 536 °F estimated value(s)
Pour point	:	Typical -39 °C / -38 °F
Flash point	:	Typical 286 °C / 547 °F (COC)
Upper / lower Flammability or Explosion limits	:	Typical 1 - 10 %(V)
Auto-ignition temperature	:	> 320 °C / 608 °F
Vapour pressure	:	0.5 Pa at 20 °C / 68 °F (estimated value(s))
Density	:	Typical 1,069 kg/m3 at 15 °C / 59 °F
Water solubility	:	Negligible.
n-octanol/water partition coefficient (log Pow)	:	> 6 (based on information on similar products)
Kinematic viscosity	:	Typical 320 mm2/s at 40 °C / 104 °F

Vapour density (air=1)	:	> 1 (estimated value(s))
Electrical conductivity	:	This material is not expected to be a static accumulator.
Evaporation rate (nBuAc=1)	:	Data not available

10. STABILITY AND REACTIVITY

Stability	:	Stable.
Conditions to Avoid	:	Extremes of temperature and direct sunlight.
Materials to Avoid	:	Strong oxidising agents.
Hazardous Decomposition Products	:	Hazardous decomposition products are not expected to form during normal storage.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment	:	Information given is based on data on the components and the toxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).
Acute Oral Toxicity	:	Expected to be of low toxicity: LD50 > 5000 mg/kg , Rat
Acute Dermal Toxicity	:	Expected to be of low toxicity: LD50 > 5000 mg/kg , Rabbit
Acute Inhalation Toxicity	:	Not considered to be an inhalation hazard under normal conditions of use.
Skin Irritation	:	Expected to be slightly irritating. Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Eye Irritation	:	Expected to be slightly irritating.
Respiratory Irritation	:	Inhalation of vapours or mists may cause irritation.
Sensitisation	:	Not expected to be a skin sensitiser.
Repeated Dose Toxicity	:	Not expected to be a hazard.
Mutagenicity	:	Not considered a mutagenic hazard.
Carcinogenicity	:	Not expected to be carcinogenic.

Solvent naphtha (petroleum), light aromatic	:	GHS / CLP: No carcinogenicity classification
Amine phosphate	:	GHS / CLP: No carcinogenicity classification
Phenothiazine	:	GHS / CLP: No carcinogenicity classification

Reproductive and Developmental Toxicity	:	Not expected to be a hazard.
Additional Information	:	Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal. ALL used oil should be handled with caution and skin contact avoided as far as possible.

12. ECOLOGICAL INFORMATION

Ecotoxicological data have not been determined specifically for this product. Information given is based on a knowledge of the components and the ecotoxicology of similar products. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Acute Toxicity	:	Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l (to aquatic organisms) LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract.
Mobility	:	Liquid under most environmental conditions. If it enters soil, it will adsorb to soil particles and will not be mobile. Floats on water.
Persistence/degradability	:	Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but the product contains components that may persist in the environment.
Bioaccumulation	:	Contains components with the potential to bioaccumulate.
Other Adverse Effects	:	Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

13. DISPOSAL CONSIDERATIONS

Material Disposal	:	Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations. Do not dispose into the environment, in drains or in water courses.
Container Disposal	:	Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.
Local Legislation	:	Disposal should be in accordance with applicable regional, national, and local laws and regulations.

14. TRANSPORT INFORMATION

US Department of Transportation Classification (49CFR)
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

IMDG
This material is not classified as dangerous under IMDG regulations.

IATA (Country variations may apply)

This material is either not classified as dangerous under IATA regulations or needs to follow country specific requirements.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Federal Regulatory Status

Notification Status

DSL	All components listed.
EINECS	All components listed or polymer exempt.
TSCA	All components listed.

Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA.

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

NFPA Rating (Health, Fire, Reactivity)	:	0, 1, 0
SDS Version Number	:	2.3
SDS Effective Date	:	02/05/2014
SDS Revisions	:	A vertical bar ( ) in the left margin indicates an amendment from the previous version.
SDS Regulation	:	The content and format of this MSDS is in accordance with the

SDS Distribution	:	OSHA Hazard Communication Standard, 29 CFR 1910.1200. The information in this document should be made available to all who may handle the product.
Disclaimer	:	The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

SECTION 1. IDENTIFICATION

Product name : Shell Spirax S5 ATE 75W-90

Product code : 001D8288

Manufacturer or supplier's details

Manufacturer/Supplier : **Shell Oil Products US**
PO Box 4427
Houston TX 77210-4427
USA

SDS Request : (+1) 877-276-7285

Customer Service :

Emergency telephone number

Spill Information : 877-504-9351

Health Information : 877-242-7400

Recommended use of the chemical and restrictions on use

Recommended use : Transmission oil.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS Label element

Hazard pictograms : No Hazard Symbol required

Signal word : No signal word

Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS criteria.
HEALTH HAZARDS:
Not classified as a health hazard under GHS criteria.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

Precautionary statements : **Prevention:**
No precautionary phrases.
Response:
No precautionary phrases.
Storage:
No precautionary phrases.
Disposal:
No precautionary phrases.

Other hazards which do not result in classification

Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Used oil may contain harmful impurities.
Not classified as flammable but will burn.

The classification of this material is based on OSHA HCS 2012 criteria.

Under normal conditions of use or in a foreseeable emergency, this product does not meet the definition of a hazardous chemical when evaluated according to the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Synthetic base oil and additives.
Highly refined mineral oil.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.
The highly refined mineral oil is only present as additive diluent.

* contains one or more of the following CAS-numbers: 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-65-0, 68037-01-4, 72623-86-0, 72623-87-1, 8042-47-5, 848301-69-9.

Hazardous components

Chemical Name	Synonyms	CAS-No.	Concentration (%)
Dialkylpolysulphide		68937-96-2	1 - 5
Amine phosphate		91745-46-9	1 - 2.4
Interchangeable low viscosity base oil (<20,5 cSt @40°C) *		Not Assigned	0 - 90

SECTION 4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal conditions.

If inhaled : No treatment necessary under normal conditions of use.
If symptoms persist, obtain medical advice.

In case of skin contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.

In case of eye contact : Flush eye with copious quantities of water.
If persistent irritation occurs, obtain medical attention.

If swallowed : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

Most important symptoms and effects, both acute and delayed : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas.
Ingestion may result in nausea, vomiting and/or diarrhoea.

Protection of first-aiders	:	When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
Immediate medical attention, special treatment	:	Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.
Unsuitable extinguishing media	:	Do not use water in a jet.
Specific hazards during fire-fighting	:	Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide may be evolved if incomplete combustion occurs. Unidentified organic and inorganic compounds.
Specific extinguishing methods	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Special protective equipment for firefighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Avoid contact with skin and eyes.
Environmental precautions	:	Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up	:	Slippery when spilt. Avoid accidents, clean up immediately. Prevent from spreading by making a barrier with sand, earth or other containment material. Reclaim liquid directly or in an absorbent. Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

Additional advice : For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.
For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.

SECTION 7. HANDLING AND STORAGE

Technical measures : Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

Precautions for safe handling : Avoid prolonged or repeated contact with skin.
Avoid inhaling vapour and/or mists.
When handling product in drums, safety footwear should be worn and proper handling equipment should be used.
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.

Avoidance of contact : Strong oxidising agents.

Product Transfer : This material has the potential to be a static accumulator.
Proper grounding and bonding procedures should be used during all bulk transfer operations.

Storage

Other data : Keep container tightly closed and in a cool, well-ventilated place.
Use properly labeled and closable containers.

Store at ambient temperature.

Packaging material : Suitable material: For containers or container linings, use mild steel or high density polyethylene.
Unsuitable material: PVC.

Container Advice : Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Oil mist, mineral	Not Assigned	TWA ((inhalable fraction))	5 mg/m3	US. ACGIH Threshold Limit Values

		(Mist)	5 mg/m3	OSHA_TRANS

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany http://www.dguv.de/inhalt/index.jsp
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

Engineering measures : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
Adequate ventilation to control airborne concentrations.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

General Information:
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.

Personal protective equipment

Respiratory protection : No respiratory protection is ordinarily required under normal

conditions of use.
In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
Select a filter suitable for the combination of organic gases and vapours [Type A/Type P boiling point >65°C (149°F)].

Hand protection
Remarks : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. PVC, neoprene or nitrile rubber gloves Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material.
Glove thickness should be typically greater than 0.35 mm depending on the glove make and model.

Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.

Skin and body protection : Skin protection is not ordinarily required beyond standard work clothes.
It is good practice to wear chemical resistant gloves.

Protective measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Environmental exposure controls

General advice : Take appropriate measures to fulfill the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before

discharge to surface water.
Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid at room temperature.
Colour	:	amber
Odour	:	Slight hydrocarbon
Odour Threshold	:	Data not available
pH	:	Not applicable
pour point	:	-45 °C / -49 °FMethod: ISO 3016
Initial boiling point and boiling range	:	> 280 °C / 536 °Festimated value(s)
Flash point	:	205 °C / 401 °F Method: ISO 2592
Evaporation rate	:	Data not available
Flammability (solid, gas)	:	Data not available
Upper explosion limit	:	Typical 10 %(V)
Lower explosion limit	:	Typical 1 %(V)
Vapour pressure	:	< 0.5 Pa (20 °C / 68 °F) estimated value(s)
Relative vapour density	:	> 1estimated value(s)
Relative density	:	0.879 (15 °C / 59 °F)
Density	:	879 kg/m3 (15.0 °C / 59.0 °F) Method: ISO 12185
Solubility(ies)		
Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	Pow: > 6(based on information on similar products)
Auto-ignition temperature	:	> 320 °C / 608 °F

Viscosity		
Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	81 mm2/s (40.0 °C / 104.0 °F) Method: ISO 3104 14.9 mm2/s (100 °C / 212 °F) Method: ISO 3104
Explosive properties	:	Not classified
Oxidizing properties	:	Data not available
Conductivity	:	This material is not expected to be a static accumulator.
Decomposition temperature	:	Data not available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.
Chemical stability	:	Stable.
Possibility of hazardous reactions	:	Reacts with strong oxidising agents.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Strong oxidising agents.
Hazardous decomposition products	:	Hazardous decomposition products are not expected to form during normal storage.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on data on the components and the toxicology of similar products.Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Information on likely routes of exposure
Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (rat): > 5,000 mg/kg Remarks: Expected to be of low toxicity:

Acute inhalation toxicity : Remarks: Not considered to be an inhalation hazard under normal conditions of use.

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Remarks: Expected to be of low toxicity:

Skin corrosion/irritation

Product:

Remarks: Expected to be slightly irritating., Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Serious eye damage/eye irritation

Product:

Remarks: Expected to be slightly irritating.

Components:

Amine phosphate:
Remarks: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation

Product:

Remarks: Not expected to be a skin sensitiser.

Components:

Dialkylpolysulphide:
Remarks: Experimental data has shown that the concentration of potentially sensitising components present in this product does not induce skin sensitisation. May cause an allergic skin reaction in sensitive individuals.

Amine phosphate:
Remarks: Experimental data has shown that the concentration of potentially sensitising components present in this product does not induce skin sensitisation. May cause an allergic skin reaction in sensitive individuals.

Germ cell mutagenicity

Product:

: Remarks: Not considered a mutagenic hazard.

Carcinogenicity

Product:

Remarks: Not expected to be carcinogenic.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
OSHA	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

Product:

: Remarks: Not expected to impair fertility., Not expected to be a developmental toxicant.

STOT - single exposure

Product:

Remarks: Not expected to be a hazard.

STOT - repeated exposure

Product:

Remarks: Not expected to be a hazard.

Aspiration toxicity

Product:

Not considered an aspiration hazard.

Further information

Product:

Remarks: Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal., ALL used oil should be handled with caution and skin contact avoided as far as possible.

Remarks: Slightly irritating to respiratory system.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Ecotoxicological data have not been determined specifically for this product.
Information given is based on a knowledge of the components and the ecotoxicology of similar products.
Unless indicated otherwise, the data presented is representa-

tive of the product as a whole, rather than for individual component(s).(LL/EL/IL50 expressed as the nominal amount of product required to prepare aqueous test extract).

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity)	:	Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to daphnia and other aquatic invertebrates (Acute toxicity)	:	Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae (Acute toxicity)	:	Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	Remarks: Data not available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: Data not available
Toxicity to bacteria (Acute toxicity)	:	Remarks: Data not available

Persistence and degradability

Product:

Biodegradability	:	Remarks: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but contains components that may persist in the environment.

Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: Contains components with the potential to bioaccumulate.

Mobility in soil

Product:

Mobility	:	Remarks: Liquid under most environmental conditions. If it enters soil, it will adsorb to soil particles and will not be mobile. Remarks: Floats on water.

Other adverse effects

no data available

Product:

Additional ecological information : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities.
Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

Poorly soluble mixture.
May cause physical fouling of aquatic organisms.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment.
Waste, spills or used product is dangerous waste.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

Contaminated packaging : Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.
Disposal should be in accordance with applicable regional, national, and local laws and regulations.

SECTION 14. TRANSPORT INFORMATION

National Regulations

US Department of Transportation Classification (49 CFR Parts 171-180)

Not regulated as a dangerous good

International Regulation

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Pollution category : Not applicable
Ship type : Not applicable
Product name : Not applicable
Special precautions : Not applicable

Special precautions for user

Remarks : Special Precautions: Refer to Chapter 7, Handling & Storage,

for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

Additional Information : MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15. REGULATORY INFORMATION

OSHA Hazards : No OSHA Hazards

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ., Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 302 : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Water Act

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

Pennsylvania Right To Know

Distillates (petroleum), solvent-dewaxed heavy paraffinic	64742-65-0

California Prop 65 This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

The components of this product are reported in the following inventories:

EINECS : All components listed or polymer exempt.

TSCA : All components listed.

DSL : All components listed.

SECTION 16. OTHER INFORMATION

Further information

NFPA Rating (Health, Fire, Reactivity) 0, 1, 0

A vertical bar (|) in the left margin indicates an amendment from the previous version.

Abbreviations and Acronyms : The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial Hygienists
ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS = Australian Inventory of Chemical Substances
ASTM = American Society for Testing and Materials
BEL = Biological exposure limits
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
CAS = Chemical Abstracts Service
CEFIC = European Chemical Industry Council
CLP = Classification Packaging and Labelling
COC = Cleveland Open-Cup
DIN = Deutsches Institut fur Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology Of Chemicals
ECHA = European Chemicals Agency
EINECS = The European Inventory of Existing Commercial Chemical Substances
EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty
IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty
MARPOL = International Convention for the Prevention of Pollution From Ships
NOEC/NOEL = No Observed Effect Concentration / No Observed Effect Level
OE_HPV = Occupational Exposure - High Production Volume

PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of Chemicals
RID = Regulations Relating to International Carriage of Dangerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

Revision Date : 12/31/2015

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

1. Product and company identification

Product name	SikaForce®-7010 (US) Part B
Supplier	Sika Corporation 201 Polito Avenue Lyndhurst, NJ 07071
Telephone	(201) 933-8800
Telefax	(201) 804-1076
Emergency telephone	CHEMTREC: 800-424-9300
e-mail address of person responsible for this SDS	INTERNATIONAL: 703-527-3887 ehs@sika-corp.com
Manufacturer	Sika Corporation, Operations 201 Polito Avenue Lyndhurst, NJ 07071 www.sikausa.com
Telephone	(201) 933 - 8800
Chemical family	Isocyanates

2. Hazards identification

This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.

Potential Health Effects

Inhalation	Causes respiratory tract irritation. Harmful if inhaled. May cause allergic respiratory reaction.
Skin	May cause allergic skin reaction. Causes skin irritation.
Eyes	Causes eye irritation.
Ingestion	Harmful if swallowed.

See Section 11 for more detailed information on health effects and symptoms.

3. Composition/information on ingredients

Component	CAS Number
Diphenylmethanediisocyanate, isomeres and homologues	9016-87-9
4,4'-methylenediphenyl diisocyanate	101-68-8
methylenediphenyl diisocyanate	26447-40-5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

First aid procedures

Inhalation	If inhaled, remove to fresh air. If breathing is difficult, trained personnel should give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
Skin contact	In case of contact, immediately flush skin with soap and plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention immediately if irritation develops and persists.
Eye contact	If easy to do, remove contact lens, if worn. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.
Ingestion	If swallowed, contact a poison control center or physician immediately. Do NOT induce vomiting unless directed to do so by medical personnel Never give anything by mouth to an unconscious person. Get medical attention immediately.

Notes to physician

Treatment	No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Fire fighting

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Unsuitable extinguishing media	none
Further information	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk without suitable training.

Protective equipment and precautions for firefighters

Special protective equipment for firefighters	Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions	Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. No action shall be taken involving any personal risk without suitable training. Keep people away from and upwind of spill/leak. Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray. Material can create slippery conditions.
Environmental precautions	Local authorities should be advised if significant spillages cannot be contained. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Methods for containment and cleaning up	Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Large spills should be collected mechanically (remove by pumping) for disposal.

7. Handling and storage

Handling	For personal protection see section 8. Avoid inhalation, ingestion and contact with skin and eyes. Smoking, eating and drinking should be prohibited in the application area.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers. To maintain product quality, do not store in heat or direct sunlight. Store in accordance with local regulations.
Other information	Storage temperature: 64 °F - 86 °F (18 °C - 30 °C)

8. Exposure controls/personal protection

Exposure limit(s)

Component	CAS Number	Content %	Basis *	Value	Exposure limit(s) / Form of exposure
4,4'-methylenediphenyl diisocyanate	101-68-8	30 - 50	ACGIH	TWA	0.005 ppm
		30 - 50	OSHA P1	C	0.02 ppm 0.2 mg/m3
		30 - 50	OSHA P0	C	0.02 ppm 0.2 mg/m3

* **Basis**
ACGIH. Threshold Limit Values (TLV)
OSHA P0. Table Z-1, Limit for Air Contaminat (1989 Vacated Values)
OSHA P1. Permissible Exposure Limits (PEL), Table Z-1, Limit for Air Contaminant
OSHA P2. Permissible Exposure Limits (PEL), Table Z-2
OSHA Z3. Table Z-3, Mineral Dust

Engineering measures	Use of adequate ventilation should be sufficient to control worker exposure to airborne contaminants. If the use of this product generates dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Personal protective equipment

Eye protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary.
Hand protection	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Skin and body protection	Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Respiratory protection	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapor/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.
Hygiene measures	Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. Remove contaminated clothing and protective equipment before entering eating areas. Wash thoroughly after handling.

9. Physical and chemical properties

Appearance

Physical state	liquid
Color	brown
Odor	musty

Safety data

Flash point	390.00 °F (198.89 °C)
pH	Note: not applicable

Boiling point	406 °F (208 °C)
Density	1.24 g/cm3 at 77 °F (25 °C)
Water solubility	Note: insoluble
Volatile organic compounds (VOC) content	0 g/l

10. Stability and reactivity

Stability	Stable under normal conditions.
Conditions to avoid	not applicable
Materials to avoid	not applicable
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological information

Acute inhalation toxicity	Component: 4,4'-methylenediphenyl diisocyanate (MDI) Acute toxicity estimate Dose: 1.5 mg/l Remarks: see user defined free text
Chronic Exposure	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity

not applicable

IARC	not applicable
OSHA	not applicable
NTP	not applicable
ACGIH	not applicable

12. Ecological information

Other information	Do not empty into drains; dispose of this material and its container in a safe way. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

13. Disposal considerations

Waste disposal methods	Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT
Not dangerous goods
IATA
Not dangerous goods
IMDG
Not dangerous goods

Other information	DOT Regulated Components: 4,4-Diphenylmethane Diisocyanate (MDI) Reportable Quantity: 11,111 pounds. When an individual containers of less than the product RQ, this material ships as Not Regulated.

15. Regulatory information

Federal Regulations

TSCA Status	On TSCA Inventory
SARA 311/312 Hazards	Acute Health Hazard

EPCRA - Emergency Planning Community Right - To - Know

SARA 302 Ingredients	not applicable		
SARA 313 Ingredients	Diphenylmethanediisocyanate, isomeres and homologues	9016-87-9	50 %

Clean Air Act

Ozone-Depletion Potential	This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

4,4'-methylenediphenyl diisocyanate	101-68-8	45 %

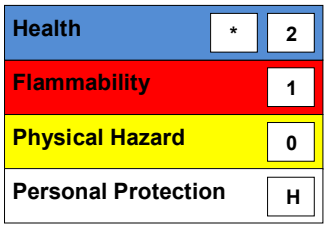
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

State Regulations

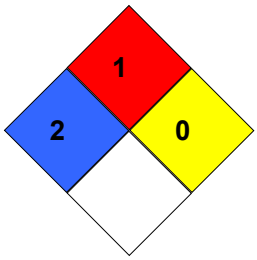
California Prop. 65 Ingredients	This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.
Other information	US EPA CERCLA Hazardous Substances (40 CFR 302) 4,4-Diphenylmethane Diisocyanate (MDI) Reportable Quantity: 5,000 pounds.

16. Other information

HMIS Classification



NFPA Classification



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Notes to Reader

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Material Safety Data Sheet

SikaForce®-7020 Part B

1 . Product and company identification

Product name : SikaForce®-7020 Part B

Supplier : Sika Corporation, Industry
30800 Stephenson Highway
Madison Heights, MI 48071
www.sikaindustry.com

Telephone no. : (888) 832 - 7452

Fax no. : (248) 577 - 0810

In case of emergency : CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer : Sika Deutschland GmbH
Kornwestheimer Str. 107
D-70439 Stuttgart
Deutschland

Telephone no. : 0711-8009-0

Validation date : **11. February 2011.**

Print date : 11. February 2011.

Product type : Liquid.

2 . Composition/information on ingredients

Name	CAS number	%
Polymeric MDI	9016-87-9	60 - 100

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3 . Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential acute health effects

Inhalation : Irritating to respiratory system. May cause sensitization by inhalation.

Ingestion : Harmful if swallowed.

Skin : Irritating to skin. May cause sensitization by skin contact.

Eyes : Irritating to eyes.

See toxicological information (section 11)

4 . First aid measures

Eye contact : Check for and remove any contact lenses. Get medical attention. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse.

Inhalation : Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. Maintain an open airway. In the event of any complaints or symptoms, avoid further exposure.

4 . First aid measures

Ingestion : Wash out mouth with water. Move exposed person to fresh air. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention. Never give anything by mouth to an unconscious person.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous combustion products : No specific data.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

7 . Handling and storage

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Consult local authorities for acceptable exposure limits.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

9 . Physical and chemical properties

Physical state : Liquid.

Flash point : Closed cup: >200°C (>392°F)

Color : Brown.

Odor : Characteristic.

Density : ~1.23 g/cm^3 [20°C (68°F)]

Viscosity : Dynamic: 90 mPa·s (90 cP)

Dispersibility properties : Not dispersible in the following materials: cold water.

Solubility : Insoluble in the following materials: cold water.

10 . Stability and reactivity

Stability : The product is stable.

Conditions to avoid : No specific data.

Materials to avoid : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

11 . Toxicological information

Potential chronic health effects

Chronic effects : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Acute toxicity

Conclusion/Summary : Not available.

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Isocyanic acid, polymethylenepolyphenylene ester	-	3	-	-	-	-

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Additional information
DOT Classification	Not regulated.		-	-	-
TDG Classification	Not regulated.		-	-	-
ADR/RID Class	Not regulated.		-	-	-
IMDG Class	Not regulated.		-	-	-
IATA-DGR Class	Not regulated.		-	-	-

PG* : Packing group

15 . Regulatory information

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.
TSCA 8(d) H and S data reporting: Isocyanic acid, polymethylenepolyphenylene ester: 1990

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

SARA 313

Form R - Reporting requirements :

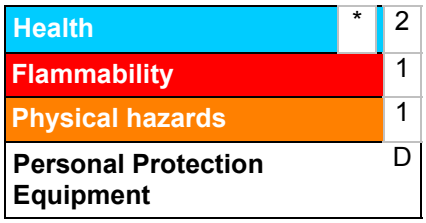
Product name	CAS number	Concentration
Isocyanic acid, polymethylenepolyphenylene ester	9016-87-9	60 - 100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

United States inventory (TSCA 8b) : All components are listed or exempted.

16 . Other information

Hazardous Material Information System (U.S.A.) :



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

Date of printing : **11.02.2011.**

Date of issue : **11.02.2011.**

Date of previous issue : **11.02.2011.**

Version : **1.04**

Indicates information that has changed from previously issued version.

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16 . Other information

OTHERS.

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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : SikaForce®-7311 L45 GR Part A

1.2 Relevant identified uses of the substance or mixture and uses advised against

At present there is no complete information available on identified uses. When the data becomes available, it will be integrated into the safety data sheet.

Product use : Sealant/adhesive.

1.3 Details of the supplier of the safety data sheet

Company : Sika Deutschland GmbH
Kornwestheimer Str. 103-107
70439 Stuttgart
Telephone : +4971180090
E-mail address : EHS@de.sika.com

1.4 Emergency telephone number

Emergency telephone number : 0173-6774799 Out of office hours only
EHS@de.sika.com

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Type of product : Mixture

Classification (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture.

Classification (67/548/EEC, 1999/45/EC)

Not a hazardous substance or mixture.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture.

2.3 Other hazards

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).
This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Remarks	:	No hazardous ingredients

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice	:	No hazards which require special first aid measures.
If inhaled	:	Move to fresh air.
In case of skin contact	:	Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water.
In case of eye contact	:	Flush eyes with water as a precaution. Remove contact lenses. Keep eye wide open while rinsing.
If swallowed	:	Clean mouth with water and drink afterwards plenty of water. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms	:	See Section 11 for more detailed information on health effects and symptoms.
Risks	:	No known significant effects or hazards.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products	:	No hazardous combustion products are known

5.3 Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.

Further information : Standard procedure for chemical fires.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.2 Environmental precautions

Environmental precautions : No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Wipe up with absorbent material (e.g. cloth, fleece).
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : For personal protection see section 8. No special handling advice required. Follow standard hygiene measures when handling chemical products

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Hygiene measures : When using do not eat or drink. When using do not smoke.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Store in accordance with local regulations.

Advice on common storage : No special restrictions on storage with other products.

Other data : No decomposition if stored and applied as directed.

7.3 Specific end use(s)

Specific use(s) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Personal protective equipment

Eye protection	:	Safety glasses
Hand protection	:	Chemical-resistant, impervious gloves complying with an approved standard must be worn at all times when handling chemical products. Reference number EN 374. Follow manufacturer specifications. Butyl rubber/nitrile rubber gloves (0,4 mm), Recommended: Butyl rubber/nitrile rubber gloves.
Skin and body protection	:	Protective clothing (e.g. Safety shoes acc. to EN ISO 20345, long-sleeved working clothing, long trousers). Rubber aprons and protective boots are additionaly recommended for mixing and stirring work.
Respiratory protection	:	No special measures required.

Environmental exposure controls

General advice	:	No special environmental precautions required.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	viscous liquid
Colour	:	various
Odour	:	characteristic
Odour Threshold	:	No data available
Flash point	:	> 101 °C
Ignition temperature	:	not applicable
Lower explosion limit (Vol%)	:	No data available
Upper explosion limit (Vol%)	:	No data available
Flammability (solid, gas)	:	No data available

Oxidizing properties	:	No data available
Auto-ignition temperature	:	No data available
pH	:	No data available
Melting point/range / Freezing point	:	No data available
Boiling point/boiling range	:	No data available
Vapour pressure	:	No data available
Density	:	ca.1,26 g/cm3 at 20 °C
Water solubility	:	Note: insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	> 20,5 mm2/s at 40 °C
Relative vapour density	:	No data available
Evaporation rate	:	No data available

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

The product is chemically stable.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid	:	No data available

10.5 Incompatible materials

Materials to avoid	:	No data available

10.6 Hazardous decomposition products

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

No data available

Skin corrosion/irritation

Product

No data available

Serious eye damage/eye irritation

Product

No data available

Respiratory or skin sensitisation

Product

No data available

Germ cell mutagenicity

Product

Mutagenicity : No data available

Carcinogenicity

Product

Carcinogenicity : No data available

Reproductive Toxicity/Fertility

Reproductive toxicity : No data available

No data available

Reproductive Toxicity/Development/Teratogenicity

Teratogenicity : No data available

No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Aspiration toxicity

No data available

SECTION 12: Ecological information

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment	:	This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	In accordance with the EWC Waste Regulation the classification of waste is to be assigned to the jurisdiction of the origin of waste. Therefore, it is not possible to assign a particular waste identification number. Completely emptied packagings may be given for recycling. Empty packaging may still contain hazardous residues. Empty packaging should be removed by a licensed waste contractor. Sika has agreed disposal contracts for all packaging which is brought into circulation in Germany. For further details see www.sika.de

SECTION 14: Transport information

ADR

Not dangerous goods
IATA
Not dangerous goods
IMDG
Not dangerous goods

14.6 Special precautions for user
No data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
not applicable

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Labelling according to EC Directives (1999/45/EC)

Further information	:	The product does not need to be labelled in accordance with EC directives or respective national laws.

Prohibition/Restriction

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)	:	not applicable
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	None of the components are listed (=> 0.1 %).
REACH - List of substances subject to authorisation (Annex XIV)	:	not applicable
REACH Information:		All substances contained in our Products are - preregistered or registered by our upstream suppliers, and/or - preregistered or registered by us, and/or - excluded from the regulation, and/or - exempted from the registration.
Water contaminating class (Germany)	:	WGK 1 slightly water endangering Gemäß VwVws vom 30.Juli 2005
VOC-CH (VOCV)	:	0,18 % no VOC duties
VOC-EU (solvent)	:	0,18 %

15.2 Chemical Safety Assessment

This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

The information contained in this Safety Data Sheet corresponds to our level of knowledge at the time of publication. All warranties are excluded. Our most current General Sales Conditions shall apply. Please consult the product data sheet prior to any any use and processing.

Changes as compared to previous version !

Material Safety Data Sheet

SikaForce®-7321 L30 Part A

1 . Product and company identification

Product name : SikaForce®-7321 L30 Part A

Supplier : Sika Corporation, Industry
30800 Stephenson Highway
Madison Heights, MI 48071
www.sikaindustry.com

Telephone no. : (888) 832 - 7452

Fax no. : (248) 577 - 0810

In case of emergency : CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer : Sika Deutschland GmbH
Kornwestheimer Str. 107
D-70439 Stuttgart
Deutschland

Telephone no. : 0711-8009-0

Validation date : **23. March 2011.**

Print date : 23. March 2011.

Product type : Liquid.

2 . Composition/information on ingredients

Name	CAS number	%
aluminium hydroxide	21645-51-2	40 - 70
Castor oil	8001-79-4	10 - 30
1,1',1",1'"-ethylenedinitrilotetrapropan-2-ol	102-60-3	1 - 5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3 . Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential acute health effects

Inhalation : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.Irritating to respiratory system.

Ingestion : May be harmful if swallowed.

Skin : Irritating to skin.

Eyes : Irritating to eyes.

See toxicological information (section 11)

4 . First aid measures

Eye contact : Check for and remove any contact lenses. Get medical attention. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse.

4 . First aid measures

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. Maintain an open airway. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Ingestion : Wash out mouth with water. Move exposed person to fresh air. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person.

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Consult local authorities for acceptable exposure limits.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

9 . Physical and chemical properties

Flash point : Closed cup: >200°C (>392°F)

Color : Various

Odor : Characteristic.

Density : ~1.63 g/cm^3 [20°C (68°F)]

10 . Stability and reactivity

Stability : The product is stable.

Conditions to avoid : No specific data.

Materials to avoid : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

11 . Toxicological information

Acute toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Additional information
DOT Classification	Not regulated.		-	-	-
TDG Classification	Not regulated.		-	-	-
ADR/RID Class	Not regulated.		-	-	-
IMDG Class	Not regulated.		-	-	-
IATA-DGR Class	Not regulated.		-	-	-

PG* : Packing group

15 . Regulatory information

U.S. Federal regulations : **TSCA 4(a) final test rules**: 4-methylpentan-2-one
TSCA 8(a) IUR: Castor oil; Glycols, polypropylene, 1,2,3-propanetriyl ether
United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Castor oil; aluminium hydroxide
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Castor oil: Immediate (acute) health hazard; aluminium hydroxide: Immediate (acute) health hazard

SARA 313

Form R - Reporting requirements :

Product name	CAS number	Concentration
4-methylpentan-2-one	108-10-1	<1

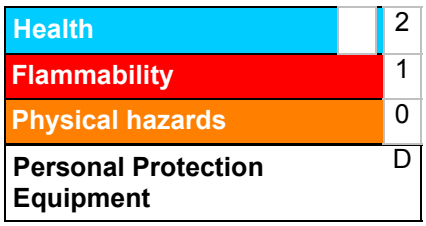
SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : **Pennsylvania RTK Hazardous Substances:** The following components are listed: ALUMINUM SOLUBLE SALTS

United States inventory (TSCA 8b) : All components are listed or exempted.

16 . Other information

Hazardous Material Information System (U.S.A.) :



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

Date of printing : **23.03.2011.**

Date of issue : **23.03.2011.**

Date of previous issue : **No previous validation.**

Version : **1**

Indicates information that has changed from previously issued version.

Notice to reader

The information contained in this Material Safety Data Sheet applies only to the actual Sika Corporation ("Sika") product identified and described herein. This information is not intended to address, nor does it address the use or application of the identified Sika product in combination with any other material, product or process. All of the information set forth herein is based on technical data regarding the identified product that Sika believes to be reliable as of the date hereof. Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's current Technical Data Sheet, product label and Material Safety Data Sheet for each Sika product, which are available at web site and/or telephone number listed in Section 1 of this MSDS.

SIKA MAKES NO WARRANTIES EXPRESS OR IMPLIED AND ASSUMES NO LIABILITY ARISING FROM THIS

16 . Other information

INFORMATION OR ITS USE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES AND SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

All sales of Sika products are subject to its current terms and conditions of sale available at www.sikacorp.com or 201-933-8800.

Safety Data Sheet

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II - United Kingdom (UK)

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Identification of the substance/preparation

Product name or Trade name :

SikaForce® -7720 L105 (formerly 1897)

Use of the substance/preparation : Chemical product for construction and industry

Company/undertaking identification

Manufacturer/Distributor	:	Sika Limited Watchmead Welwyn Garden City Hertfordshire. AL7 1BQ United Kingdom
Telephone no.	:	01707 394444
Fax no.	:	01707 329129
e-mail address of person responsible for this SDS	:	EHS@uk.sika.com
Emergency telephone number	:	+44 (0)1707 363899 (available during office hours).

2. HAZARDS IDENTIFICATION

The product is not classified as dangerous according to Directive 1999/45/EC and its amendments.

See section 11 for more detailed information on health effects and symptoms.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical family/ Characteristics : Modified polyol

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. FIRST AID MEASURES

First-aid measures

Inhalation	:	Get medical attention if symptoms occur.
Ingestion	:	Do not induce vomiting unless directed to do so by medical personnel. Maintain an open airway. Seek immediate medical attention.
Skin contact	:	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Eye contact	:	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
Notes to physician	:	No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

See section 11 for more detailed information on health effects and symptoms.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : In a fire or if heated, a pressure increase will occur and the container may burst.
Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13).

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container.

7. HANDLING AND STORAGE

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Avoid contact with eyes, skin and clothing. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Packaging materials

Recommended : Use original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredient name	Occupational exposure limits
No exposure limit value known.	

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

Exposure controls

Occupational exposure controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

Respiratory protection : No special measures required.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Recommended: Butyl rubber/nitrile rubber gloves.

Eye protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: Use barrier skin cream.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. PHYSICAL AND CHEMICAL PROPERTIES

General information

Appearance

Form : Liquid.

Colour : White.

Odour : Sweetish.

Important health, safety and environmental information

Flash point : Closed cup: >101°C (>213.8°F)

Density : ~1.6 g/cm^3 [23°C (73.4°F)]

Solubility : Insoluble in the following materials: water

10. STABILITY AND REACTIVITY

Stability : The product is stable.

Conditions to avoid : No specific data.

Materials to avoid : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Potential acute health effects

Inhalation : May cause irritation.

Ingestion : Can cause gastrointestinal disturbances.

Skin contact : May cause skin irritation.

Eye contact : May cause eye irritation.

No known significant effects or critical hazards.

Chronic effects : No known significant effects or critical hazards.

12. ECOLOGICAL INFORMATION

Environmental effects : Avoid contact of spilt material and runoff with soil and surface waterways. Do not empty into drains; dispose of this material and its container in a safe way.

13. DISPOSAL CONSIDERATIONS

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

European waste catalogue (EWC) : 08 04 10 waste adhesives and sealants other than those mentioned in 08 04 09

Packaging : Completely emptied packaging or practically empty packaging containing dried/cured residues, once relieved of all pressure can be disposed of as non-hazardous waste.

Packaging may still contain hazardous residues and disposal should undertaken by a licensed waste contractor.

Any disposal practice must be in compliance with local and national laws and regulations.

14. TRANSPORT INFORMATION

International transport regulations

ADR

Not regulated.

IMDG

Not regulated.

Marine pollutant : No

IATA

Not regulated.

15. REGULATORY INFORMATION

EU regulations

Classification and labeling have been determined according to EU Directives 67/548/EEC and 1999/45/EC (including amendments) and take into account the intended product use.

Classification : This product is not classified according to EU legislation.

VOC content (EU) : VOC (w/w): 0.22%

National regulations

15. REGULATORY INFORMATION

Regulatory information : Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 (CHIP 3)
Control of Substances Hazardous to Health Regulations 2002 (COSHH) (as amended)
Health & Safety at Work Act 1974
The Environmental Protection (Duty of Care) Regulations 1991
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2007

Guidance Publications : Approved Code of Practice - Management of Health and Safety at Work, HSE
General Approved Code of Practice to COSHH Regulations, HSE.

16. OTHER INFORMATION

History

Date of printing : **12.04.2010.**

Date of issue : **12.04.2010.**

Date of previous issue : **No previous validation.**

Indicates information that has changed from previously issued version.

Notice to reader

The information contained in this Safety Data Sheet corresponds to our level of knowledge at the time of publication. All warranties are excluded. Our most current General Sales Conditions shall apply. Please consult the product data sheet prior to any use and processing.

Material Safety Data Sheet

SikaForce-7812 L7 MR

1 . Product and company identification

Product name : SikaForce-7812 L7 MR

Supplier : Sika Corporation, Industry
30800 Stephenson Highway
Madison Heights, MI 48071
www.sikaindustry.com

Telephone no. : (888) 832 - 7452

Fax no. : (248) 577 - 0810

In case of emergency : CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer : Sika Deutschland GmbH
Kornwestheimer Str. 107
D-70439 Stuttgart
Deutschland

Telephone no. : 0711-8009-0

Validation date : **11. February 2011.**

Print date : 11. February 2011.

Product type : Liquid.

2 . Composition/information on ingredients

Name	CAS number	%
Castor oil	8001-79-4	10 - 30
Zeolites	1318-02-1	10 - 30
Quadrol	102-60-3	1 - 5
M-DEA	13680-35-8	1 - 5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3 . Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential acute health effects

Inhalation : May cause irritation.

Ingestion : May be harmful if swallowed.

Skin : May cause skin irritation.

Eyes : Irritating to eyes.

See toxicological information (section 11)

4 . First aid measures

Eye contact : Check for and remove any contact lenses. Get medical attention. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse.

4 . First aid measures

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. Maintain an open airway. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Ingestion : Wash out mouth with water. Move exposed person to fresh air. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person.

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Consult local authorities for acceptable exposure limits.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

9 . Physical and chemical properties

Flash point : Closed cup: >101°C (>213.8°F)

Color : Beige.

Odor : Sweetish.

Density : ~1.3 g/cm^3 [20°C (68°F)]

10 . Stability and reactivity

Stability : The product is stable.

Conditions to avoid : No specific data.

Materials to avoid : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

11 . Toxicological information

Potential chronic health effects

Chronic effects : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Acute toxicity

Conclusion/Summary : Not available.

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Zeolites	-	3	-	-	-	-

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Additional information
DOT Classification	Not regulated.		-	-	-
TDG Classification	Not regulated.		-	-	-
ADR/RID Class	Not regulated.		-	-	-
IMDG Class	Not regulated.		-	-	-

14 . Transport information

IATA-DGR Class	Not regulated.		-	-	-

PG* : Packing group

15 . Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: Siloxanes and Silicones, di-Me, reaction products with silica
United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Castor oil; Limestone
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Castor oil: Immediate (acute) health hazard; Limestone: Immediate (acute) health hazard

State regulations :

Massachusetts Substances:	The following components are listed: CALCIUM CARBONATE
New Jersey Hazardous Substances:	The following components are listed: ZEOLITE
Pennsylvania RTK Hazardous Substances:	The following components are listed: LIMESTONE

United States inventory (TSCA 8b) : All components are listed or exempted.

16 . Other information

Hazardous Material Information System (U.S.A.) :

Health	*	2
Flammability		1
Physical hazards		0
Personal Protection Equipment		D

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

Date of printing : **11.02.2011.**

Date of issue : **11.02.2011.**

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Version : **1.03**

Indicates information that has changed from previously issued version.

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16 . Other information

SIKA MAKES NO WARRANTIES EXPRESS OR IMPLIED AND ASSUMES NO LIABILITY ARISING FROM THIS INFORMATION OR ITS USE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES AND SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

All sales of Sika products are subject to its current terms and conditions of sale available at www.sikacorp.com or 201-933-8800.

Material Safety Data Sheet

Sikaforce-7815

1 . Product and company identification

Product name : Sikaforce-7815

Supplier : Sika Corporation, Industry
30800 Stephenson Highway
Madison Heights, MI 48071
www.sikaindustry.com

Telephone no. : (888) 832 - 7452

Fax no. : (248) 577 - 0810

In case of emergency : CHEMTREC: 800-424-9300
INTERNATIONAL: 703-527-3887

Manufacturer : Sika Danmark A/S
Præstemosevej 2-4
DK-3480 Fredensborg
Danmark

Telephone no. : (0045) 48 18 85 85

Validation date : **7. May 2010.**

Print date : 7. May 2010.

Product type : Liquid.

2 . Composition/information on ingredients

Name	CAS number	%
Castor oil	8001-79-4	10 - 30
4,4'-methylenebis[2,6-diethylaniline]	13680-35-8	1 - 5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

3 . Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Potential acute health effects

Inhalation : May be harmful if inhaled. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

Ingestion : May be harmful if swallowed

Skin : Moderately irritating to the skin. May cause sensitization by skin contact.

Eyes : Irritating to eyes.

See toxicological information (section 11)

4 . First aid measures

Eye contact : Check for and remove any contact lenses. Get medical attention. Immediately flush eyes with plenty of water for at least 15 minutes.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse.

4 . First aid measures

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. Maintain an open airway. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Ingestion : Wash out mouth with water. Move exposed person to fresh air. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person.

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5 . Fire-fighting measures

Flammability of the product : In a fire or if heated, a pressure increase will occur and the container may burst.

Extinguishing media

Suitable : Use an extinguishing agent suitable for the surrounding fire.

Not suitable : None known.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Consult local authorities for acceptable exposure limits.

Engineering measures : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

9 . Physical and chemical properties

Physical state : Liquid.

Flash point : Closed cup: >101°C (>213.8°F)

Color : Beige.

Odor : Sweetish.

Density : ~1.2 g/cm^3 [23°C (73.4°F)]

10 . Stability and reactivity

Stability : The product is stable.

Conditions to avoid : No specific data.

Materials to avoid : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

11 . Toxicological information

Potential chronic health effects

Chronic effects : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Acute toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Additional information
DOT Classification	Not regulated.		-	-	-
TDG Classification	Not regulated.		-	-	-
ADR/RID Class	Not regulated.		-	-	-
IMDG Class	Not regulated.		-	-	-
IATA-DGR Class	Not regulated.		-	-	-

PG* : Packing group

15 . Regulatory information

U.S. Federal regulations : **United States inventory (TSCA 8b)**: All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Castor oil; Limestone
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Castor oil: Immediate (acute) health hazard; Limestone: Immediate (acute) health hazard

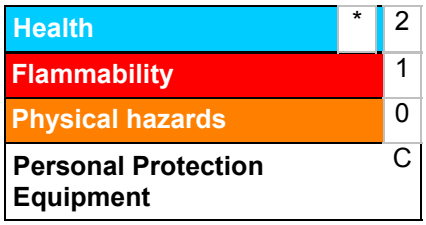
State regulations :

Massachusetts Substances:	The following components are listed: CALCIUM CARBONATE
New Jersey Hazardous Substances:	The following components are listed: ZEOLITE
Pennsylvania RTK Hazardous Substances:	The following components are listed: LIMESTONE

United States inventory (TSCA 8b) : All components are listed or exempted.

16 . Other information

Hazardous Material Information System (U.S.A.) :



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

Date of printing : **07.05.2010.**

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Date of previous issue : **No previous validation.**

Version : **1.01**

Indicates information that has changed from previously issued version.

Notice to reader

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SIKA MAKES NO WARRANTIES EXPRESS OR IMPLIED AND ASSUMES NO LIABILITY ARISING FROM THIS INFORMATION OR ITS USE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES AND SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.

16 . Other information

All sales of Sika products are subject to its current terms and conditions of sale available at www.sikacorp.com or 201-933-8800.

SAFETY DATA SHEET

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II - Germany

Sikasil-Gasket

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1 Product identifier

Product name : Sikasil-Gasket

1.2 Relevant identified uses of the substance or mixture and uses advised against

At present there is no complete information available on identified uses. When the data becomes available, it will be integrated into the safety data sheet.

Product use : Sealant/adhesive.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Distributor	:	Sika Deutschland GmbH Kornwestheimer Str. 107 D-70439 Stuttgart Deutschland
Telephone no.:	:	0711-8009-0
Fax no.	:	0711-8009-321
e-mail address of person responsible for this SDS	:	EHS@de.sika.com
Emergency telephone number	:	+49-(0)173-6774799 (Only out of office hour)

*** draft only ***

1.4 Emergency telephone number

Supplier

Telephone number : +49-(0)173-6774799 (Only out of office hour)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Directive 1999/45/EC [DPD]

The product is not classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : Not classified.

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard symbol or symbols	:	
Indication of danger	:	
Risk phrases	:	This product is not classified according to EU legislation.
Safety phrases	:	Not applicable.
Hazardous ingredients	:	
Supplemental label elements	:	Safety data sheet available for professional user on request.

SECTION 2: Hazards identification

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : Not available.

SECTION 3: Composition/information on ingredients

Substance/mixture : Mixture

Chemical family/ Characteristics : Silicon polymer

Product/ingredient name Identifiers	%	Classification 67/548/EEC	Classification Regulation (EC) No. 1272/2008 [CLP]	Type
triacetoxyethylsilane EC: 241-677-4 CAS: 17689-77-9	>= 1 - < 3	R14 Xn; R22 C; R34	Acute Tox. 4, H302 Skin Corr. 1B, H314	[1]
methylsilanetriyl-triacetate EC: 224-221-9 CAS: 4253-34-3	>= 1 - < 3	R14 Xn; R22 C; R34	Skin Corr. 1B, H314	[1]
		See Section 16 for the full text of the R-phrases declared above.	**See Section 16 for the full text of the H statements declared above.**	

*** draft only ***

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs or vPvBs or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Ingestion : Do not induce vomiting unless directed to do so by medical personnel. Maintain an open airway. Seek immediate medical attention.

4.2 Most important symptoms and effects, both acute and delayed

SECTION 4: First aid measures

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : None known.

*** draft only ***

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

5.3 Advice for firefighters

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also Section 8 for additional information on hygiene measures.

SECTION 6: Accidental release measures

6.2 Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container.

Large spill : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13).

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Avoid contact with eyes, skin and clothing. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

*** draft only ***

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

7.3 Specific end use(s)

Recommendations : Not available.

Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

No exposure limit value known.

SECTION 8: Exposure controls/personal protection

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

DNELs/DMELs

No DELs available.

PNECs

No PECs available.

8.2 Exposure controls

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin protection

*** draft only ***

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Reference number EN 374. Recommended: Butyl rubber/nitrile rubber gloves.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: Use barrier skin cream.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : No special measures required.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Paste.

Colour : Red.

Odour : Acetic acid.

Odour threshold : Not available.

pH :

Melting point/freezing point : Not available.

SECTION 9: Physical and chemical properties

Initial boiling point and boiling range	:	Not available.
Flash point	:	Closed cup: >101°C
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Not available.
Burning time	:	Not applicable.
Burning rate	:	Not applicable.
Upper/lower flammability or explosive limits	:	Not applicable.
Vapour pressure	:	Not applicable.
Vapour density	:	Not available.
Density	:	~1.04 g/cm³ [20°C (68°F)]
Relative density	:	Not available.
Solubility(ies)	:	Insoluble in the following materials: water
Partition coefficient: n-octanol/ water	:	Not available.
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	Not available.
Viscosity	:	Not available.
Explosive properties	:	Not available.
Oxidising properties	:	Not available.

9.2 Other information

No additional information.

*** draft only ***

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : The product is stable.

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid : No specific data.

10.5 Incompatible materials : No specific data.

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
methylsilanetriyl-triacetate	LD50 Oral	Rat	2060 mg/kg	-

Conclusion/Summary : Not available.

SECTION 11: Toxicological information

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitisation

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : May cause eye irritation.

Inhalation : May cause irritation.

Skin contact : May cause skin irritation.

Ingestion : Can cause gastrointestinal disturbances.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

Conclusion/Summary : Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Other information : Not available.

*** draft only ***

SECTION 12: Ecological information

12.1 Toxicity

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Conclusion/Summary : Not available.

12.3 Bioaccumulative potential

Not available.

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

*** draft only ***

Methods of disposal : In accordance with the EWC Waste Regulation the classification of waste is to be assigned to the jurisdiction of the origin of waste. Therefor it is not possible to assign a particular waste identification number.

Completely emptied packagings may be given for recycling. Empty packaging may still contain hazardous residues. Empty packaging should be removed by a licensed waste contractor.

Sika has agreed disposal contracts for all packaging which is brought into circulation in Germany.

For further details see www.sika.de

SECTION 14: Transport information

	ADR/RID - ADN	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name			
14.3 Transport hazard class(es)	-	-	-
14.4 Packing group	-	-	-
14.5 Environmental hazards	No	No	No

SECTION 14: Transport information

Additional information	-	-	-

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

VOC content (EU) : VOC (w/w): 0%

Other EU regulations

*** draft only ***

REACH Information: : All substances contained in our Products are
- preregistered or registered by our upstream suppliers, and/or
- preregistered or registered by us, and/or
- excluded from the regulation, and/or
- exempted from the registration.

Europe inventory : Not available.

National regulations

National regulations

National regulations

Hazard class for water : 1 according Appendix No. 4 (Gemäß VwVws vom 17. Mai 1999)

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number

Full text of abbreviated H statements

SECTION 16: Other information

: H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H318 Causes serious eye damage.

Full text of classifications [CLP/GHS] : Acute Tox. 4, H302 ACUTE TOXICITY: ORAL - Category 4
Eye Dam. 1, H318 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
Skin Corr. 1B, H314 SKIN CORROSION/IRRITATION - Category 1B
Skin Irrit. 2, H315 SKIN CORROSION/IRRITATION - Category 2

Full text of abbreviated R phrases : R14- Reacts violently with water.
R22- Harmful if swallowed.
R34- Causes burns.

Full text of classifications [DSD/DPD] : C - Corrosive
Xn - Harmful

History

Date of printing : **20.08.2014.**

Date of issue : ***.**

Date of previous issue : **No previous validation.**

Notice to reader

The information contained in this Safety Data Sheet corresponds to our level of knowledge at the time of publication. All warranties are excluded. Our most current General Sales Conditions shall apply. Please consult the product data sheet prior to any use and processing.

*** draft only ***

SP 4910 Resin RAL7035

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EC) No. 453/2010

Date of issue:21/05/2015 Revision date:01/10/2015 Supersedes:21/05/2015 Version: 1.2

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Name : SP 4910 Resin RAL7035

Product group : Resin

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Industrial/Professional use spec : For professional use only
Industrial

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Gurit (UK) Ltd
St Cross Business Park
PO30 5WU Isle of Wight - United Kingdom
T +44 (0) 1983 828 000
contact@gurit.com - www.gurit.com

1.4. Emergency telephone number

Emergency number : +44 (0) 2392 242148

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin corrosion/irritation, Category 2	H315
Serious eye damage/eye irritation, Category 2	H319
Sensitisation — Skin, category 1	H317
Hazardous to the aquatic environment — Chronic Hazard, Category 3	H412

Full text of H statements : see section 16

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS07

Signal word (CLP) : Warning

Hazardous ingredients : 1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)-, polymer with (chloromethyl)oxirane

Hazard statements (CLP) : H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (CLP) : P261 - Avoid breathing vapours
P264 - Wash hands thoroughly after handling
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear protective gloves, protective clothing, eye protection
P302+P352 - IF ON SKIN: Wash with plenty of water

Child-resistant fastening : No

Tactile warning : No

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)-, polymer with (chloromethyl)oxirane	(CAS No) 30499-70-8 (EC no) 608-489-8	>= 50	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 Aquatic Chronic 3, H412
Titanium dioxide substance with national workplace exposure limit(s) (GB)	(CAS No) 13463-67-7 (EC no) 236-675-5 (REACH-no) 01-2119489379-17	10 - 25	Not classified

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Move the affected person away from the contaminated area and into the fresh air. Call a POISON CENTER or doctor/physician if you feel unwell. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Do not induce vomiting. Get immediate medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : None under normal use.

Symptoms/injuries after skin contact : May cause an allergic skin reaction. May cause moderate irritation.

Symptoms/injuries after eye contact : May cause slight irritation.

Symptoms/injuries after ingestion : None under normal use.

Symptoms/injuries upon intravenous administration : None under normal use.

Chronic symptoms : Skin irritation, dermatitis and sensitisation.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide. Dry powder. Foam. Water spray.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : None under normal use.

Explosion hazard : None under normal use.

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Precautionary measures fire : Evacuate area.

Firefighting instructions : Exercise caution when fighting any chemical fire.

Protection during firefighting : Self-contained breathing apparatus.

Other information : Collect contaminated fire fighting water seperately. It must not enter drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Protective clothing.

6.1.2. For emergency responders

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Avoid release to the environment. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage.

Methods for cleaning up : Recover mechanically the product. This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

For further information refer to section 13. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station.

Hygiene measures : Do not eat, drink or smoke when using this product. Separate working clothes from town clothes. Launder separately. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container closed when not in use. Keep cool. Protect from sunlight.

Maximum storage period : 2 year

Storage temperature : ≤ 30 °C

Storage area : Store away from heat. Store in a well-ventilated place.

Special rules on packaging : Keep only in original container.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Titanium dioxide (13463-67-7)		
United Kingdom	WEL TWA (mg/m³)	10 mg/m³ (total inhalable) 4 mg/m³ (respirable)
United Kingdom	WEL STEL (mg/m³)	30 mg/m³ (calculated-total inhalable) 12 mg/m³ (calculated-respirable)

8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station.

Personal protective equipment : Gloves. Protective clothing. Safety glasses.

Hand protection : Protective gloves

Eye protection : Safety glasses

Respiratory protection : In case of inadequate ventilation wear respiratory protection

Environmental exposure controls : Avoid release to the environment.

Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid

Colour	:	Grey.
Odour	:	characteristic.
Odour threshold	:	No data available
pH	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility	:	No data available
Log Pow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Product is not explosive.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Heat.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

1,3-Propanediol, 2-ethyl-2-(hydroxymethyl)-, polymer with (chloromethyl)oxirane (30499-70-8)	
LD50 oral rat	> 2000 mg/kg
LD50 dermal rabbit	> 2000 mg/kg

Titanium dioxide (13463-67-7)	
LD50 oral rat	> 10000 mg/kg

Skin corrosion/irritation	:	Causes skin irritation.
Serious eye damage/irritation	:	Causes serious eye irritation.
Respiratory or skin sensitisation	:	May cause an allergic skin reaction.
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified

Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste)	:	Disposal must be done according to official regulations.
Waste treatment methods	:	Dispose of contents/container in accordance with licensed collector's sorting instructions.
Waste disposal recommendations	:	Avoid release to the environment. Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	:	Avoid release to the environment.
European List of Waste (LoW) code	:	08 04 09* - waste adhesives and sealants containing organic solvents or other dangerous substances

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

Not regulated for transport

14.2. UN proper shipping name

Proper Shipping Name (ADR)	:	Not applicable
Proper Shipping Name (IMDG)	:	Not applicable
Proper Shipping Name (IATA)	:	Not applicable

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR)	:	Not applicable

IMDG

Transport hazard class(es) (IMDG)	:	Not applicable

IATA

Transport hazard class(es) (IATA)	:	Not applicable

14.4. Packing group

Packing group (ADR)	:	Not applicable
Packing group (IMDG)	:	Not applicable
Packing group (IATA)	:	Not applicable

14.5. Environmental hazards

Dangerous for the environment	:	No
Marine pollutant	:	No
Other information	:	No supplementary information available

14.6. Special precautions for user

- Overland transport

No data available

- Transport by sea

No data available

- Air transport

No data available

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no substances with Annex XVII restrictions

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Full text of H- and EUH-statements:

Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Sensitisation — Skin, category 1
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H412	Harmful to aquatic life with long lasting effects

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

SP 8565 Hardener

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EC) No. 453/2010

Date of issue:27/05/2015 Revision date:02/10/2015 Supersedes:27/05/2015 Version: 1.3

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Name : SP 8565 Hardener

Product group : Hardener

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Industrial/Professional use spec : For professional use only
Industrial

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Gurit (UK) Ltd
St Cross Business Park
PO30 5WU Isle of Wight - United Kingdom
T +44 (0) 1983 828 000
contact@gurit.com - www.gurit.com

1.4. Emergency telephone number

Emergency number : +44 (0) 2392 242148

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Acute toxicity (oral), Category 4	H302
Acute toxicity (dermal), Category 4	H312
Skin corrosion/irritation, Category 1B	H314
Sensitisation — Skin, category 1	H317
Hazardous to the aquatic environment — Chronic Hazard, Category 3	H412

Full text of H statements : see section 16

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS05 GHS07

Signal word (CLP) : Danger

Hazardous ingredients : 3-aminomethyl-3,5,5-trimethylcyclohexylamine, Calcium nitrate

Hazard statements (CLP) : H302+H312 - Harmful if swallowed or in contact with skin
H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (CLP) : P260 - Do not breathe vapours
P264 - Wash hands, forearms and face thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear protective gloves, protective clothing, eye protection

Child-resistant fastening : No

Tactile warning : No

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
3-aminomethyl-3,5,5-trimethylcyclohexylamine	(CAS No) 2855-13-2 (EC no) 220-666-8 (EC index no) 612-067-00-9 (REACH-no) 01-2119514687-32	>= 50	Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Dermal), H312 Skin Corr. 1B, H314 Skin Sens. 1, H317 Aquatic Chronic 3, H412
Calcium nitrate	(CAS No) 10124-37-5 (EC no) 233-332-1	3 - 5	Acute Tox. 4 (Oral), H302
ethanol, ethyl alcohol substance with national workplace exposure limit(s) (GB)	(CAS No) 64-17-5 (EC no) 200-578-6 (EC index no) 603-002-00-5 (REACH-no) 01-2119457610-43	3 - 5	Flam. Liq. 2, H225

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Move the affected person away from the contaminated area and into the fresh air. Call a POISON CENTER or doctor/physician if you feel unwell.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Do not induce vomiting. Get immediate medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : None under normal use.

Symptoms/injuries after skin contact : May cause an allergic skin reaction. May cause moderate irritation.

Symptoms/injuries after eye contact : May cause slight irritation.

Symptoms/injuries after ingestion : None under normal use.

Symptoms/injuries upon intravenous administration : None under normal use.

Chronic symptoms : Skin irritation, dermatitis and sensitisation.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide. Dry powder. Foam. Water spray.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : None under normal use.

Explosion hazard : None under normal use.

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Precautionary measures fire : Evacuate area.

Firefighting instructions : Exercise caution when fighting any chemical fire.

Protection during firefighting : Self-contained breathing apparatus.

Other information : Collect contaminated fire fighting water seperately. It must not enter drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Protective clothing.

6.1.2. For emergency responders

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Avoid release to the environment. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage.

Methods for cleaning up : Recover mechanically the product. This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

For further information refer to section 13. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station.

Hygiene measures : Do not eat, drink or smoke when using this product. Separate working clothes from town clothes. Launder separately. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container closed when not in use. Keep cool. Protect from sunlight.

Storage temperature : ≤ 30 °C

Storage area : Store away from heat. Store in a well-ventilated place.

Special rules on packaging : Keep only in original container.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

ethanol, ethyl alcohol (64-17-5)		
United Kingdom	Local name	Ethanol
United Kingdom	WEL TWA (mg/m³)	1920 mg/m³
United Kingdom	WEL TWA (ppm)	1000 ppm
United Kingdom	WEL STEL (mg/m³)	5760 mg/m³ (calculated)
United Kingdom	WEL STEL (ppm)	3000 ppm (calculated)

8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station.

Personal protective equipment : Gloves. Protective clothing. Safety glasses.

Hand protection : Protective gloves

Eye protection : Safety glasses

Environmental exposure controls : Avoid release to the environment.

Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid

Colour : Yellow.

Odour	:	Amine-like.
Odour threshold	:	No data available
pH	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility	:	No data available
Log Pow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available
Oxidising properties	:	No data available
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Product is not explosive.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Heat.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Dermal: Harmful in contact with skin.

ATE CLP (oral)	1258.506 mg/kg bodyweight
ATE CLP (dermal)	1649.175 mg/kg bodyweight

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
LD50 oral rat	1030 mg/kg

Calcium nitrate (10124-37-5)	
LD50 oral rat	302 mg/kg

ethanol, ethyl alcohol (64-17-5)	
LD50 oral rat	7060 mg/kg
LC50 inhalation rat (mg/l)	124.7 mg/l/4h

Skin corrosion/irritation	:	Causes severe skin burns and eye damage.
Serious eye damage/irritation	:	Serious eye damage, category 1, implicit
Respiratory or skin sensitisation	:	May cause an allergic skin reaction.
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified

Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

SECTION 12: Ecological information

12.1. Toxicity

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
EC50 Daphnia 1	14.6 - 21.5 mg/l (Exposure time: 48 h - Species: Daphnia magna [semi-static])

Calcium nitrate (10124-37-5)	
LC50 fish 1	10000 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [static])

ethanol, ethyl alcohol (64-17-5)	
LC50 fish 1	12.0 - 16.0 ml/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [static])
EC50 Daphnia 1	9268 - 14221 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	> 100 mg/l (Exposure time: 96 h - Species: Pimephales promelas [static])
EC50 Daphnia 2	2 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

3-aminomethyl-3,5,5-trimethylcyclohexylamine (2855-13-2)	
Log Pow	0.79 (at 23 °C)

ethanol, ethyl alcohol (64-17-5)	
Log Pow	-0.32

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste)	:	Disposal must be done according to official regulations.
Waste treatment methods	:	Dispose of contents/container in accordance with licensed collector's sorting instructions.
Waste disposal recommendations	:	Avoid release to the environment. Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	:	Avoid release to the environment.
European List of Waste (LoW) code	:	08 04 09* - waste adhesives and sealants containing organic solvents or other dangerous substances

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR)	:	2735
UN-No. (IMDG)	:	2735
UN-No. (IATA)	:	2735

14.2. UN proper shipping name

Proper Shipping Name (ADR)	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S.
Proper Shipping Name (IMDG)	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S.
Proper Shipping Name (IATA)	:	Polyamines, liquid, corrosive, n.o.s.
Transport document description (ADR)	:	UN 2735 POLYAMINES, LIQUID, CORROSIVE, N.O.S. (3-aminomethyl-3,5,5-trimethylcyclohexylamine), 8, II, (E)
Transport document description (IMDG)	:	UN 2735 POLYAMINES, LIQUID, CORROSIVE, N.O.S. (3-aminomethyl-3,5,5-trimethylcyclohexylamine), 8, II

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : 8

Danger labels (ADR) : 8

:

IMDG

Transport hazard class(es) (IMDG) : 8

Danger labels (IMDG) : 8

:

IATA

Transport hazard class(es) (IATA) : 8

Hazard labels (IATA) : 8

:

14.4. Packing group

Packing group (ADR) : II

Packing group (IMDG) : II

Packing group (IATA) : II

14.5. Environmental hazards

Dangerous for the environment : No

Marine pollutant : No

Other information : No supplementary information available

14.6. Special precautions for user

- Overland transport

Classification code (ADR) : C7

Special provisions (ADR) : 274

Limited quantities (ADR) : 1l

Excepted quantities (ADR) : E2

Packing instructions (ADR) : P001, IBC02

Mixed packing provisions (ADR) : MP15

Portable tank and bulk container instructions (ADR) : T11

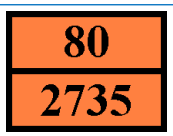
Portable tank and bulk container special provisions (ADR) : TP1, TP27

Tank code (ADR) : L4BN

Vehicle for tank carriage : AT

Transport category (ADR) : 2

Hazard identification number (Kemler No.) : 80

Orange plates	:	
Tunnel restriction code (ADR)	:	E
EAC code	:	2X
APP code	:	B

- Transport by sea

Special provisions (IMDG)	:	274
Limited quantities (IMDG)	:	1 L
Excepted quantities (IMDG)	:	E2
Packing instructions (IMDG)	:	P001
IBC packing instructions (IMDG)	:	IBC02
Tank instructions (IMDG)	:	T11
Tank special provisions (IMDG)	:	TP1, TP27
EmS-No. (Fire)	:	F-A
EmS-No. (Spillage)	:	S-B
Stowage category (IMDG)	:	A
Stowage and segregation (IMDG)	:	'Separated from' acids.
Properties and observations (IMDG)	:	Colourless to yellowish liquids or solutions with a pungent odour. Miscible with or soluble in water. When involved in a fire, evolve toxic gases. Corrosive to most metals, especially to copper and its alloys. Reacts violently with acids. Cause burns to skin, eyes and mucous membranes.

- Air transport

PCA Excepted quantities (IATA)	:	E2
PCA Limited quantities (IATA)	:	Y840
PCA limited quantity max net quantity (IATA)	:	0.5L
PCA packing instructions (IATA)	:	851
PCA max net quantity (IATA)	:	1L
CAO packing instructions (IATA)	:	855
CAO max net quantity (IATA)	:	30L
Special provisions (IATA)	:	A3
ERG code (IATA)	:	8L

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no substances with Annex XVII restrictions
Contains no substance on the REACH candidate list
Contains no REACH Annex XIV substances

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Full text of H- and EUH-statements:

Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Flam. Liq. 2	Flammable liquids, Category 2
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
Skin Sens. 1	Sensitisation — Skin, category 1

H225	Highly flammable liquid and vapour
H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H317	May cause an allergic skin reaction
H412	Harmful to aquatic life with long lasting effects

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

Gurit

Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 10/17/2012 Reviewed on 10/17/2012

*
1 Identification of the substance/mixture and of the company/undertaking

· **Product identifier**

· **Trade name: SP 9435**
· **Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
· **Application of the substance / the preparation** Epoxy sealing

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**

GURIT (UK) Ltd
St. CROSS BUSINESS PARK
NEWPORT I.O.W.
PO30 5WU
UNITED KINGDOM
TEL:+44(0)1983 828000
FAX:+44(0)1983 828100

GURIT (Canada) Inc.
175, rue Péladeau
Magog (Québec)
J1X 5G9
Canada
T: +1 819 847 2182
F: +1 819 847 2572

· **Information department:** Product safety department.
· **Emergency telephone number:** Contact as above

*
2 Hazards identification

· **Classification of the substance or mixture**

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**

Irritant
Irritating to eyes and skin. May cause sensitization by skin contact.

Dangerous for the environment
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
· **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

· **Label elements**

· **Labelling according to EU guidelines:**
The product has been classified and marked in accordance with directives on hazardous materials.

· **Code letter and hazard designation of product:**
Xi Irritant
N Dangerous for the environment

· **Hazard-determining components of labelling:**
bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight $\leq$ 700)
Diglycidylether of Bisphenol F

· **Risk phrases:**
Irritating to eyes and skin.
May cause sensitization by skin contact.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

· **Safety phrases:**
Avoid contact with skin.
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
After contact with skin, wash immediately with plenty of soap and water
Wear suitable gloves and eye/face protection.
Use appropriate container to avoid environmental contamination.
This material and its container must be disposed of as hazardous waste.

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· **Special labelling of certain preparations:**
Contains epoxy constituents. See information supplied by the manufacturer.
· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 1
Fire = 1
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = *1
Fire = 1
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

*
3 Composition/information on ingredients

· **Chemical characterization: Mixtures**
· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**		
25068-38-6	bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)	25-50%
9003-36-5	Diglycidylether of Bisphenol F	25-50%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

· **Description of first aid measures**
· **After inhalation:**
Supply fresh air and to be sure call for a doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed**
No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Firefighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
Water haze
Foam
Fire-extinguishing powder
Carbon dioxide
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.

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· **Advice for firefighters**
· **Protective equipment:** No special measures required.
· **Additional information**
Collect contaminated fire fighting water separately. It must not enter the sewage system.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Keep away from heat and direct sunlight.
· **Information about protection against explosions and fires:** No special measures required.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Protect from heat and direct sunlight.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
14807-96-6 Talc (Mg3H2(SiO3)4) (10-25%)	
PEL	20 mppcf ppm (containing <1% Quartz)
REL	2* mg/m³ *respirable dust
TLV	2 R mg/m³ E
13463-67-7 titanium dioxide (2.5-10%)	
PEL	15* mg/m³ *total dust
REL	LFC (LOQ 0.2 mg/m3)
TLV	10 mg/m³

· **Additional information:** The lists that were valid during the creation were used as basis.

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· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
Use suitable respiratory protective device in case of insufficient ventilation.
Filter P2
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **For the permanent contact of a maximum of 15 minutes gloves made of the following materials are suitable:**
Nitrile rubber, NBR
· **As protection from splashes gloves made of the following materials are suitable:**
Nitrile rubber, NBR
· **Eye protection:**

Tightly sealed goggles

· **Body protection:** Protective work clothing

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Pasty
Color:	According to product specification
· **Odor:**	Weak, characteristic
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	> 200℃ (> 392 ℉)
· **Flash point:**	251℃ (484 ℉)
· **Ignition temperature:**	460.0℃ (860 ℉)
· **Auto igniting:**	Product is not selfigniting.

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· **Danger of explosion:**	Product does not present an explosion hazard.
· **Vapor pressure at 20℃ (68 ℉):**	0.1 hPa
· **Density:**	Not determined.
· **Solubility in / Miscibility with Water:**	Not miscible or difficult to mix.
· **Viscosity: Dynamic at 20℃ (68 ℉):**	128000 mPas
· **Solvent content:**	
Organic solvents:	0.0 %
Water:	0.0 %
Solids content:	70 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** Danger of toxic pyrolysis products.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

25068-38-6 bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤700)

Oral	LD50	10000 mg/kg (rat)
Dermal	LD50	2000 mg/kg (rat)

· **Primary irritant effect:**
· **on the skin:** Irritant to skin and mucous membranes.
· **on the eye:** Irritating effect.
· **Sensitization:** Sensitization possible through skin contact.
· **Additional toxicological information:**
The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

14807-96-6	Talc (Mg3H2(SiO3)4)	3
13463-67-7	titanium dioxide	3
7631-86-9	silicon dioxide, chemically prepared	3

· **NTP (National Toxicology Program)**

None of the ingredients is listed.

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12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Do not allow product to reach ground water, water course or sewage system.
Water hazard class 1 (Self-assessment): slightly hazardous for water
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
Hand over to hazardous waste disposers.

· **Uncleaned packagings:**
· **Recommendation:**
Packagings that cannot be cleansed are to be disposed of in the same manner as the product.

*
14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN3077
· **UN proper shipping name**	
· **DOT, IMDG, IATA**	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700), Diglycidylether of Bisphenol F)
· **ADR**	3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700), Diglycidylether of Bisphenol F)
· **Transport hazard class(es)**	
· **DOT, IMDG**	

· **Class**	9 Miscellaneous dangerous substances and articles.
· **Label**	9

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· **ADR, IATA**

· **Class**	9 Miscellaneous dangerous substances and articles
· **Label**	9
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	No
· **Special marking (ADR):**	Symbol (fish and tree)
· **Special marking (IATA):**	Symbol (fish and tree)
· **Special precautions for user**	Warning: Miscellaneous dangerous substances and articles
· **Danger code (Kemler):**	90
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.

*
15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
None of the ingredient is listed.

· **Section 313 (Specific toxic chemical listings):**
None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**

25068-38-6	bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700)
28064-14-4	Diglycidylether of Bisphenol F
14807-96-6	Talc (Mg3H2(SiO3)4)
25852-37-3	polymer of polymethylmethacrylate and butyl acrylate
13463-67-7	titanium dioxide
7631-86-9	silicon dioxide, chemically prepared
471-34-1	calcium carbonate

· **Proposition 65**

· **Chemicals known to cause cancer:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**
None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**
None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**
None of the ingredients is listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

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· **TLV (Threshold Limit Value established by ACGIH)**

14807-96-6	Talc (Mg3H2(SiO3)4)	A4
13463-67-7	titanium dioxide	A4

· **MAK (German Maximum Workplace Concentration)**

None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

13463-67-7	titanium dioxide

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

· **National regulations:**

· **Water hazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.
This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

· **Department issuing MSDS:** Health, Safety & Environmental department.
· **Contact:** SIMON RHODES
· *** Data compared to the previous version altered.**

Spabond 730 Hardener

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EC) No. 453/2010

Date of issue:29/05/2015 Revision date: : Version: 2.2

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Name : Spabond 730 Hardener

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Industrial/Professional use spec : For professional use only
Industrial

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Gurit (UK) Ltd
St Cross Business Park
PO30 5WU Isle of Wight - United Kingdom
T +44 (0) 1983 828 000
contact@gurit.com - www.gurit.com

1.4. Emergency telephone number

Emergency number : +44 (0) 2392 242148

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin corrosion/irritation, Category 2	H315
Serious eye damage/eye irritation, Category 1	H318
Sensitisation — Skin, category 1	H317
Reproductive toxicity, Category 1B	H360
Hazardous to the aquatic environment — Chronic Hazard, Category 3	H412

Full text of H statements : see section 16

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS05 GHS07 GHS08

Signal word (CLP) : Danger

Hazardous ingredients : N,N-dimethylformamide, dimethyl formamide, Bis[(dimethylamino)methyl]phenol

Hazard statements (CLP) : Restricted to professional users
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H318 - Causes serious eye damage
H360 - May damage the unborn child
H412 - Harmful to aquatic life with long lasting effects

Precautionary statements (CLP) : P202 - Do not handle until all safety precautions have been read and understood
P261 - Avoid breathing vapours
P264 - Wash hands, forearms and face thoroughly after handling
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear protective gloves, protective clothing, eye protection

Child-resistant fastening : No

Tactile warning : No

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
2,4,6-tris(dimethylaminomethyl)phenol	(CAS No) 90-72-2 (EC no) 202-013-9 (EC index no) 603-069-00-0 (REACH-no) 01-2119560597-27	< 10	Skin Corr. 1B, H314 Skin Sens. 1, H317 Aquatic Chronic 3, H412
Diethylene glycol bis(3-aminopropyl) ether	(CAS No) 4246-51-9 (EC no) 224-207-2 (REACH-no) 05-2115221331-67	< 5	Skin Corr. 1B, H314 Skin Sens. 1, H317
Bis[(dimethylamino)methyl]phenol	(CAS No) 71074-89-0 (EC no) 275-162-0 (REACH-no) 01-2119560597-27	< 3	Skin Corr. 1B, H314
N,N-dimethylformamide, dimethyl formamide substance listed as REACH Candidate (N,N-dimethylformamide)	(CAS No) 68-12-2 (EC no) 200-679-5 (EC index no) 616-001-00-X	< 1	Flam. Liq. 3, H226 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation), H332 Eye Irrit. 2, H319 Repr. 1B, H360D

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Move the affected person away from the contaminated area and into the fresh air. Call a POISON CENTER or doctor/physician if you feel unwell. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Do not induce vomiting. Get immediate medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : None under normal use.

Symptoms/injuries after skin contact : May cause an allergic skin reaction. May cause moderate irritation.

Symptoms/injuries after eye contact : May cause slight irritation.

Symptoms/injuries after ingestion : None under normal use.

Symptoms/injuries upon intravenous administration : None under normal use.

Chronic symptoms : Skin irritation, dermatitis and sensitisation.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide. Dry powder. Foam. Water spray.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : None under normal use.

Explosion hazard : None under normal use.

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Precautionary measures fire : Evacuate area.

Firefighting instructions : Exercise caution when fighting any chemical fire.
Protection during firefighting : Self-contained breathing apparatus.
Other information : Collect contaminated fire fighting water seperately. It must not enter drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Wear protective clothing.

6.1.2. For emergency responders

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Avoid release to the environment. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage.
Methods for cleaning up : On land, sweep or shovel into suitable containers. This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

For further information refer to section 13. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station.
Hygiene measures : Do not eat, drink or smoke when using this product. Separate working clothes from town clothes. Launder separately. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container closed when not in use. Keep cool. Protect from sunlight.
Storage temperature : ≤ 30 °C
Storage area : Store away from heat. Store in a well-ventilated place.
Special rules on packaging : Keep only in original container.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

N,N-dimethylformamide, dimethyl formamide (68-12-2)		
EU	Local name	N,N Dimethylformamide
EU	IOELV TWA (mg/m³)	15 mg/m³
EU	IOELV TWA (ppm)	5 ppm
EU	IOELV STEL (mg/m³)	30 mg/m³
EU	IOELV STEL (ppm)	10 ppm
EU	Notes	skin
United Kingdom	Local name	N,N-Dimethylformamide
United Kingdom	WEL TWA (mg/m³)	15 mg/m³
United Kingdom	WEL TWA (ppm)	5 ppm
United Kingdom	WEL STEL (mg/m³)	30 mg/m³
United Kingdom	WEL STEL (ppm)	10 ppm
United Kingdom	Remark (WEL)	Sk

8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station.
Personal protective equipment : Gloves. Protective clothing. Safety glasses.

Hand protection : protective gloves

Eye protection : Safety glasses

Environmental exposure controls : Avoid release to the environment.

Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Colour	: Yellow.
Odour	: No data available
Odour threshold	: No data available
pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available.
Oxidising properties	: No data available.
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Product is not explosive.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Heat.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

N,N-dimethylformamide, dimethyl formamide (68-12-2)	
LD50 oral rat	2800 mg/kg
LD50 dermal rat	1100 mg/kg

Diethylene glycol bis(3-aminopropyl) ether (4246-51-9)	
LD50 oral rat	4290 mg/kg

2,4,6-tris(dimethylaminomethyl)phenol (90-72-2)	
LD50 oral rat	1200 mg/kg
LD50 dermal rat	1280 mg/kg

Skin corrosion/irritation : Causes skin irritation.
Serious eye damage/irritation : Causes serious eye damage.
Respiratory or skin sensitisation : May cause an allergic skin reaction.
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : May damage the unborn child.
Specific target organ toxicity (single exposure) : Not classified
Specific target organ toxicity (repeated exposure) : Not classified
Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

N,N-dimethylformamide, dimethyl formamide (68-12-2)	
LC50 fish 1	6300 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)
EC50 Daphnia 1	7500 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	9800 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])
EC50 Daphnia 2	8485 mg/l (Exposure time: 48 h - Species: Daphnia magna [semi-static])

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

N,N-dimethylformamide, dimethyl formamide (68-12-2)	
BCF fish 1	0.3 - 1.2
Log Pow	-1.028

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

Component	
N,N-dimethylformamide, dimethyl formamide (68-12-2)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Disposal must be done according to official regulations.
Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
Waste disposal recommendations : Avoid release to the environment. Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

Not regulated for transport

14.2. UN proper shipping name

Proper Shipping Name (ADR) : Not applicable

Proper Shipping Name (IMDG) : Not applicable
Proper Shipping Name (IATA) : Not applicable

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : Not applicable

IMDG

Transport hazard class(es) (IMDG) : Not applicable

IATA

Transport hazard class(es) (IATA) : Not applicable

14.4. Packing group

Packing group (ADR) : Not applicable
Packing group (IMDG) : Not applicable
Packing group (IATA) : Not applicable

14.5. Environmental hazards

Dangerous for the environment : No
Marine pollutant : No
Other information : No supplementary information available

14.6. Special precautions for user

- Overland transport

No data available

- Transport by sea

No data available

- Air transport

No data available

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no substances with Annex XVII restrictions

Contains a substance on the REACH candidate list in concentration ≥ 0.1% or with a lower specific limit: N,N-dimethylformamide (EC 200-679-5, CAS 68-12-2)

Contains no REACH Annex XIV substances

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

A chemical safety assessment has been carried out

SECTION 16: Other information

Full text of H- and EUH-statements:

Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
Repr. 1B	Reproductive toxicity, Category 1B
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
Skin Sens. 1	Sensitisation — Skin, category 1

H226	Flammable liquid and vapour
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage
H319	Causes serious eye irritation
H332	Harmful if inhaled
H360	May damage fertility or the unborn child
H360D	May damage the unborn child
H412	Harmful to aquatic life with long lasting effects

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

Spabond 730 Resin

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EC) No. 453/2010

Date of issue:29/05/2015 Revision date:22/09/2015 Supersedes:29/05/2015 Version: 1.3

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Name : Spabond 730 Resin

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Industrial/Professional use spec : For professional use only
Industrial

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Gurit (UK) Ltd
St Cross Business Park
PO30 5WU Isle of Wight - United Kingdom
T +44 (0) 1983 828 000
contact@gurit.com - www.gurit.com

1.4. Emergency telephone number

Emergency number : +44 (0) 2392 242148

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin corrosion/irritation, Category 2	H315
Serious eye damage/eye irritation, Category 2	H319
Sensitisation — Skin, category 1	H317
Hazardous to the aquatic environment — Chronic Hazard, Category 2	H411

Full text of H statements : see section 16

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS07 GHS09

Signal word (CLP) : Warning

Hazardous ingredients : reaction product: bisphenol-A-(epichlorhydrin), epoxy resin (number average molecular weight ≤ 700), Formaldehyde, polymer with (chloromethyl)oxirane and phenol

Hazard statements (CLP) : H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H411 - Toxic to aquatic life with long lasting effects

Precautionary statements (CLP) : P261 - Avoid breathing vapours
P264 - Wash hands, forearms and face thoroughly after handling
P272 - Contaminated work clothing should not be allowed out of the workplace
P273 - Avoid release to the environment
P280 - Wear protective gloves, protective clothing, eye protection
P302+P352 - IF ON SKIN: Wash with plenty of water

Child-resistant fastening : No

Tactile warning : No

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
reaction product: bisphenol-A-(epichlorhydrin), epoxy resin (number average molecular weight ≤ 700)	(CAS No) 25068-38-6 (EC no) 500-033-5 (EC index no) 603-074-00-8 (REACH-no) 01-2119456619-26	>= 50	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 Aquatic Chronic 2, H411
Formaldehyde, polymer with (chloromethyl)oxirane and phenol	(CAS No) 9003-36-5 (EC no) 500-006-8 (REACH-no) 01-2119454393-40	10 - 25	Skin Irrit. 2, H315 Skin Sens. 1, H317 Aquatic Chronic 2, H411

Specific concentration limits:

Name	Product identifier	Specific concentration limits
reaction product: bisphenol-A-(epichlorhydrin), epoxy resin (number average molecular weight ≤ 700)	(CAS No) 25068-38-6 (EC no) 500-033-5 (EC index no) 603-074-00-8 (REACH-no) 01-2119456619-26	(C >= 5) Eye Irrit. 2, H319 (C >= 5) Skin Irrit. 2, H315

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Move the affected person away from the contaminated area and into the fresh air. Call a POISON CENTER or doctor/physician if you feel unwell. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Do not induce vomiting. Get immediate medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : None under normal use.

Symptoms/injuries after skin contact : May cause an allergic skin reaction. May cause moderate irritation.

Symptoms/injuries after eye contact : May cause slight irritation.

Symptoms/injuries after ingestion : None under normal use.

Symptoms/injuries upon intravenous administration : None under normal use.

Chronic symptoms : Skin irritation, dermatitis and sensitisation.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide. Dry powder. Foam. Water spray.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : None under normal use.

Explosion hazard : None under normal use.

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Precautionary measures fire : Evacuate area.

Firefighting instructions : Exercise caution when fighting any chemical fire.

Protection during firefighting : Self-contained breathing apparatus.
Other information : Collect contaminated fire fighting water seperately. It must not enter drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Wear protective clothing.

6.1.2. For emergency responders

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Avoid release to the environment. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage.
Methods for cleaning up : On land, sweep or shovel into suitable containers. This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

For further information refer to section 13. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station.
Hygiene measures : Do not eat, drink or smoke when using this product. Separate working clothes from town clothes. Launder separately. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container closed when not in use. Keep cool. Protect from sunlight.
Storage area : Store away from heat. Store in a well-ventilated place.
Special rules on packaging : Keep only in original container.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station.
Personal protective equipment : Gloves. Protective clothing. Safety glasses.
Hand protection : protective gloves
Eye protection : Safety glasses

Environmental exposure controls : Avoid release to the environment.
Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Solid
Colour : Yellow.
Odour : No data available
Odour threshold : No data available
pH : No data available

Relative evaporation rate (butylacetate=1)	:	No data available
Melting point	:	No data available
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	No data available
Relative vapour density at 20 °C	:	No data available
Relative density	:	No data available
Solubility	:	No data available
Log Pow	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosive properties	:	No data available.
Oxidising properties	:	No data available.
Explosive limits	:	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Product is not explosive.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Heat.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Formaldehyde, polymer with (chloromethyl)oxirane and phenol (9003-36-5)	
LD50 oral rat	> 2 g/kg

reaction product: bisphenol-A-(epichlorhydrin), epoxy resin (number average molecular weight ≤ 700) (25068-38-6)	
LD50 oral rat	11400 mg/kg

Skin corrosion/irritation	:	Causes skin irritation.
Serious eye damage/irritation	:	Causes serious eye irritation.
Respiratory or skin sensitisation	:	May cause an allergic skin reaction.
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
Specific target organ toxicity (single exposure)	:	Not classified
Specific target organ toxicity (repeated exposure)	:	Not classified
Aspiration hazard	:	Not classified

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

reaction product: bisphenol-A-(epichlorhydrin), epoxy resin (number average molecular weight ≤ 700) (25068-38-6)	
Persistence and degradability	May cause long-term adverse effects in the environment.

12.3. Bioaccumulative potential

reaction product: bisphenol-A-(epichlorhydrin), epoxy resin (number average molecular weight ≤ 700) (25068-38-6)	
Bioaccumulative potential	Not established.

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Disposal must be done according to official regulations.

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Waste disposal recommendations : Avoid release to the environment. Dispose in a safe manner in accordance with local/national regulations.

Ecology - waste materials : Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR) : 3077

UN-No. (IMDG) : 3077

UN-No. (IATA) : 3077

14.2. UN proper shipping name

Proper Shipping Name (ADR) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

Proper Shipping Name (IMDG) : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

Proper Shipping Name (IATA) : Environmentally hazardous substance, solid, n.o.s.

Transport document description (ADR) : UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (reaction product: bisphenol-A-(epichlorhydrin), epoxy resin (number average molecular weight ≤ 700) ; Formaldehyde, polymer with (chloromethyl)oxirane and phenol), 9, III, (E)

Transport document description (IMDG) : UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (reaction product: bisphenol-A-(epichlorhydrin), epoxy resin (number average molecular weight ≤ 700) ; Formaldehyde, polymer with (chloromethyl)oxirane and phenol), 9, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : 9

Danger labels (ADR) : 9

:

IMDG

Transport hazard class(es) (IMDG) : 9

Danger labels (IMDG) : 9

:

IATA

Transport hazard class(es) (IATA) : 9

Hazard labels (IATA) : 9

:

14.4. Packing group

Packing group (ADR) : III

Packing group (IMDG) : III

Packing group (IATA) : III

14.5. Environmental hazards

Dangerous for the environment : Yes

Marine pollutant : Yes

Other information : No supplementary information available

14.6. Special precautions for user

- Overland transport

Classification code (ADR) : M7

Special provisions (ADR) : 274, 335, 601

Limited quantities (ADR) : 5kg

Excepted quantities (ADR) : E1

Packing instructions (ADR) : P002, IBC08, LP02, R001

Special packing provisions (ADR) : PP12, B3

Mixed packing provisions (ADR) : MP10

Portable tank and bulk container instructions (ADR) : T1, BK1, BK2

Portable tank and bulk container special provisions (ADR) : TP33

Tank code (ADR) : SGAV, LGBV

Vehicle for tank carriage : AT

Transport category (ADR) : 3

Special provisions for carriage - Packages (ADR) : V13

Special provisions for carriage - Bulk (ADR) : VV1

Special provisions for carriage - Loading, unloading and handling (ADR) : CV13

Hazard identification number (Kemler No.) : 90

Orange plates :

Tunnel restriction code (ADR) : E

EAC code : 2Z

- Transport by sea

Special provisions (IMDG) : 274, 335, 966, 967

Limited quantities (IMDG) : 5 kg

Excepted quantities (IMDG) : E1

Packing instructions (IMDG) : P002, LP02

Special packing provisions (IMDG)	:	PP12
IBC packing instructions (IMDG)	:	IBC08
IBC special provisions (IMDG)	:	B3
Tank instructions (IMDG)	:	T1, BK1, BK2, BK3
Tank special provisions (IMDG)	:	TP33
EmS-No. (Fire)	:	F-A
EmS-No. (Spillage)	:	S-F
Stowage category (IMDG)	:	A
Stowage and segregation (IMDG)	:	When transported in BK3 bulk container, see 7.6.2.12 and 7.7.3.9.

- Air transport

PCA Excepted quantities (IATA)	:	E1
PCA Limited quantities (IATA)	:	Y956
PCA limited quantity max net quantity (IATA)	:	30kgG
PCA packing instructions (IATA)	:	956
PCA max net quantity (IATA)	:	400kg
CAO packing instructions (IATA)	:	956
CAO max net quantity (IATA)	:	400kg
Special provisions (IATA)	:	A97, A158, A179, A197
ERG code (IATA)	:	9L

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no substances with Annex XVII restrictions

Contains no substance on the REACH candidate list

Contains no REACH Annex XIV substances

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Full text of H- and EUH-statements:

Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
Skin Sens. 1	Sensitisation — Skin, category 1
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H411	Toxic to aquatic life with long lasting effects

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

Spabond 730 Hardener

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EC) No. 453/2010

Date of issue:29/05/2015 Revision date:30/10/2015 Supersedes:29/05/2015 Version: 2.4

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture

Name : Spabond 730 Hardener

Product group : Hardener

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Industrial/Professional use spec : For professional use only
Industrial

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Gurit (UK) Ltd
St Cross Business Park
PO30 5WU Isle of Wight - United Kingdom
T +44 (0) 1983 828 000
contact@gurit.com - www.gurit.com

1.4. Emergency telephone number

Emergency number : +44 (0) 2392 242148

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Skin corrosion/irritation, Category 1C	H314
Sensitisation — Skin, category 1	H317
Reproductive toxicity, Category 1B	H360

Full text of H statements : see section 16

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :

GHS05 GHS07 GHS08

Signal word (CLP) : Danger

Hazardous ingredients : N,N-dimethylformamide, dimethyl formamide, Diethylene glycol bis(3-aminopropyl) ether, 2,4,6-tris(dimethylaminomethyl)phenol, Bis[(dimethylamino)methyl]phenol

Hazard statements (CLP) : H314 - Causes severe skin burns and eye damage
H317 - May cause an allergic skin reaction
H360 - May damage the unborn child

Precautionary statements (CLP) : P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P260 - Do not breathe vapours
P264 - Wash hands, forearms and face thoroughly after handling
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves, protective clothing, eye protection

Child-resistant fastening : No

Tactile warning : No

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
2,4,6-tris(dimethylaminomethyl)phenol	(CAS No) 90-72-2 (EC no) 202-013-9 (EC index no) 603-069-00-0 (REACH-no) 01-2119560597-27	< 10	Skin Corr. 1B, H314 Skin Sens. 1, H317 Aquatic Chronic 3, H412
Diethylene glycol bis(3-aminopropyl) ether	(CAS No) 4246-51-9 (EC no) 224-207-2 (REACH-no) 05-2115221331-67	< 5	Skin Corr. 1B, H314 Skin Sens. 1, H317
Bis[(dimethylamino)methyl]phenol	(CAS No) 71074-89-0 (EC no) 275-162-0 (REACH-no) 01-2119560597-27	< 3	Skin Corr. 1B, H314
N,N-dimethylformamide, dimethyl formamide substance listed as REACH Candidate (N,N-dimethylformamide)	(CAS No) 68-12-2 (EC no) 200-679-5 (EC index no) 616-001-00-X	< 1	Flam. Liq. 3, H226 Acute Tox. 4 (Dermal), H312 Acute Tox. 4 (Inhalation:dust,mist), H332 Eye Irrit. 2, H319 Repr. 1B, H360D

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation : Move the affected person away from the contaminated area and into the fresh air. Call a POISON CENTER or doctor/physician if you feel unwell. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion : Do not induce vomiting. Get immediate medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : None under normal use.

Symptoms/injuries after skin contact : May cause an allergic skin reaction. May cause moderate irritation.

Symptoms/injuries after eye contact : May cause slight irritation.

Symptoms/injuries after ingestion : None under normal use.

Symptoms/injuries upon intravenous administration : None under normal use.

Chronic symptoms : Skin irritation, dermatitis and sensitisation.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide. Dry powder. Foam. Water spray.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : None under normal use.

Explosion hazard : None under normal use.

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Precautionary measures fire : Evacuate area.

Firefighting instructions : Exercise caution when fighting any chemical fire.

Protection during firefighting : Self-contained breathing apparatus.

Other information : Collect contaminated fire fighting water seperately. It must not enter drains.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Protective equipment : Wear protective clothing. Protective clothing.

6.1.2. For emergency responders

Emergency procedures : Ventilate area.

6.2. Environmental precautions

Avoid release to the environment. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment : Collect spillage.

Methods for cleaning up : On land, sweep or shovel into suitable containers. This material and its container must be disposed of in a safe way, and as per local legislation. Recover mechanically the product.

6.4. Reference to other sections

For further information refer to section 13. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station.

Hygiene measures : Do not eat, drink or smoke when using this product. Separate working clothes from town clothes. Launder separately. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Keep container closed when not in use. Keep cool. Protect from sunlight.

Storage temperature : ≤ 30 °C

Storage area : Store away from heat. Store in a well-ventilated place.

Special rules on packaging : Keep only in original container.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

N,N-dimethylformamide, dimethyl formamide (68-12-2)		
EU	Local name	N,N Dimethylformamide
EU	IOELV TWA (mg/m³)	15 mg/m³
EU	IOELV TWA (ppm)	5 ppm
EU	IOELV STEL (mg/m³)	30 mg/m³
EU	IOELV STEL (ppm)	10 ppm
EU	Notes	skin
United Kingdom	Local name	N,N-Dimethylformamide
United Kingdom	WEL TWA (mg/m³)	15 mg/m³
United Kingdom	WEL TWA (ppm)	5 ppm
United Kingdom	WEL STEL (mg/m³)	30 mg/m³
United Kingdom	WEL STEL (ppm)	10 ppm
United Kingdom	Remark (WEL)	Sk

8.2. Exposure controls

Appropriate engineering controls : Ensure good ventilation of the work station.

Personal protective equipment : Gloves. Protective clothing. Safety glasses.

Hand protection : protective gloves. Protective gloves

Eye protection : Safety glasses

Environmental exposure controls : Avoid release to the environment.

Other information : Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Colour	: Yellow.
Odour	: Amine-like.
Odour threshold	: No data available
pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility	: No data available
Log Pow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available.
Oxidising properties	: No data available.
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Product is not explosive.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Heat.

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

N,N-dimethylformamide, dimethyl formamide (68-12-2)	
LD50 oral rat	2800 mg/kg
LD50 dermal rat	1100 mg/kg

Diethylene glycol bis(3-aminopropyl) ether (4246-51-9)	
LD50 oral rat	4290 mg/kg

2,4,6-tris(dimethylaminomethyl)phenol (90-72-2)	
LD50 oral rat	1200 mg/kg
LD50 dermal rat	1280 mg/kg

Skin corrosion/irritation : Causes severe skin burns and eye damage.
Serious eye damage/irritation : Serious eye damage, category 1, implicit
Respiratory or skin sensitisation : May cause an allergic skin reaction.
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : May damage the unborn child.
Specific target organ toxicity (single exposure) : Not classified
Specific target organ toxicity (repeated exposure) : Not classified
Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

N,N-dimethylformamide, dimethyl formamide (68-12-2)	
LC50 fish 1	6300 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)
EC50 Daphnia 1	7500 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC50 fish 2	9800 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss [flow-through])
EC50 Daphnia 2	8485 mg/l (Exposure time: 48 h - Species: Daphnia magna [semi-static])

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

N,N-dimethylformamide, dimethyl formamide (68-12-2)	
BCF fish 1	0.3 - 1.2
Log Pow	-1.028

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

Component	
N,N-dimethylformamide, dimethyl formamide (68-12-2)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste) : Disposal must be done according to official regulations.
Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
Waste disposal recommendations : Avoid release to the environment. Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials : Avoid release to the environment.
European List of Waste (LoW) code : 08 04 09* - waste adhesives and sealants containing organic solvents or other dangerous substances

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

Not regulated for transport

14.2. UN proper shipping name

Proper Shipping Name (ADR) : Not applicable
Proper Shipping Name (IMDG) : Not applicable
Proper Shipping Name (IATA) : Not applicable

14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : Not applicable

IMDG

Transport hazard class(es) (IMDG) : Not applicable

IATA

Transport hazard class(es) (IATA) : Not applicable

14.4. Packing group

Packing group (ADR) : Not applicable
Packing group (IMDG) : Not applicable
Packing group (IATA) : Not applicable

14.5. Environmental hazards

Dangerous for the environment : No
Marine pollutant : No
Other information : No supplementary information available

14.6. Special precautions for user

- Overland transport

No data available

- Transport by sea

No data available

- Air transport

No data available

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations

Contains no substances with Annex XVII restrictions

Contains a substance on the REACH candidate list in concentration ≥ 0.1% or with a lower specific limit: N,N-dimethylformamide (EC 200-679-5, CAS 68-12-2)

Contains no REACH Annex XIV substances

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

A chemical safety assessment has been carried out
No chemical safety assessment has been carried out

SECTION 16: Other information

Full text of H- and EUH-statements:

Acute Tox. 4 (Dermal)	Acute toxicity (dermal), Category 4
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 3	Flammable liquids, Category 3

Repr. 1B	Reproductive toxicity, Category 1B
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
Skin Sens. 1	Sensitisation — Skin, category 1
H226	Flammable liquid and vapour
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H332	Harmful if inhaled
H360	May damage fertility or the unborn child
H360D	May damage the unborn child
H412	Harmful to aquatic life with long lasting effects

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

SYNLUBE CLP 320

Product Use: Industrial Oil
Product Number(s): 032726

Company Identification
YX Energi A/S
Buddingevej 195
DK-2860 Søborg

Denmark

Transportation Emergency Response
Europe: 0044/(0)18 65 407333
Health Emergency
Europe: 0044/(0)18 65 407333
Product Information
Technical Information: 0045/39 47 8100
FAX number: 0045/39 47 8110

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	EC NUMBER	SYMBOL / RISK PHRASES	AMOUNT
Alkylated diphenylamine	Proprietary	Xi/R36, N/R51/53	< 2 %weight

The full text of all R-phrases is shown in Section 16.

SECTION 3 HAZARDS IDENTIFICATION

CLASSIFICATION: Not classified as dangerous according to EU regulatory guidelines.
IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to be harmful.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a synthetic hydrocarbon oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

DELAYED OR OTHER HEALTH EFFECTS: Not classified.

ENVIRONMENTAL EFFECTS: Not classified.

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SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 260 °C (500 °F) (Min)
Autoignition: No Data Available
Flammability (Explosive) Limits (% by volume in air): Lower: No data available Upper: No data available

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Specific Use: Industrial Oil

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by

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themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances. Refer to appropriate CEN standards.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Polyvinyl Chloride (PVC or Vinyl).
Respiratory Protection: No respiratory protection is normally required. If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.

No applicable occupational exposure limits exist for this material or its components. Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Yellow
Physical State: Liquid
Odor: Characteristic
pH: Not Applicable
Vapor Pressure: No data available
Vapor Density (Air = 1): No data available
Boiling Point: No Data Available
Solubility: Insoluble in water.
Freezing Point: No Data Available
Density: 1.01 kg/l @ 20°C (68°F) (Typical)
Viscosity: 320 mm2/s @ 40°C (104°F) (Typical)
Viscosity: No data available

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SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: Aldehydes (Elevated temperatures)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.

Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components. No product toxicology data available.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms. The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No Data Available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

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In accordance with European Waste Catalogue (E.W.C.) the codification is the following: 13 02 06

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.
ADR/RID Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT

ICAO/IATA Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:
01=EU. Directive 76/769/EEC: Restrictions on the marketing and use of certain dangerous substances.
02=EU Directive 90/394/EEC: Carcinogens at work.
03=EU Directive 92/85/EEC: Pregnant or breastfeeding workers.
04=EU Directive 96/82/EC (Seveso II): Article 9.
05=EU Directive 96/82/EC (Seveso II): Articles 6 and 7.
06=EU Directive 98/24/EC: Chemical agents at work.

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).
CLASSIFICATION - LABELING:
Under the criteria of the directive EEC/67/548 (dangerous substances) and EEC/1999/45 (dangerous preparations): Not classified

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: Changed from own formulation to purchased product.
Revision Date: DECEMBER 12, 2006

Full text of R-phrases:
R36; Irritating to eyes.
R51/53; Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value		TWA - Time Weighted Average	
STEL - Short-term Exposure Limit		PEL - Permissible Exposure Limit	
CVX - Chevron		CAS - Chemical Abstract Service Number	

Prepared according to the criteria of the directive 2001/58/EC by the Chevron Energy Technology Company, 100 Chevron Way, Richmond, California 94802.

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Meropa Synthetic WM 320

Product Use: Industrial Gear Lubricant
Product Number(s): 278012
Synonyms: Pinnacle WM 320
Company Identification
Chevron Products Company
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevron.com
Product Information: 1 (800) 582-3835, LUBETEK@chevron.com

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Not classified as hazardous according to 29 CFR 1910.1200 (2012).

HAZARDS NOT OTHERWISE CLASSIFIED: Not Applicable

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Highly refined mineral oil (C15 - C50)	Mixture	0.1 - 1.5 %weight

SECTION 4 FIRST AID MEASURES

Description of first aid measures
Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Most important symptoms and effects, both acute and delayed
IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

DELAYED OR OTHER HEALTH EFFECTS: Not classified

Indication of any immediate medical attention and special treatment needed Not Applicable

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying

non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: Keep out of the reach of children.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge. Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Highly refined mineral oil (C15 - C50)	OSHA Z-1	5 mg/m3	--	--	--
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)
Vapor Density (Air = 1): >1
Initial Boiling Point: 315°C (599°F)
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: Not Applicable
Melting Point: Not Applicable
Density: 0.9 kg/l @ 15°C (59°F) (Typical)
Viscosity: 320 mm2/s @ 40°C (104°F) Minimum
Coefficient of Therm. Expansion / °F: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): No Data Available

Flashpoint: (Cleveland Open Cup) 232 °C (450 °F) (Typical)
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for product components.

Skin Corrosion/Irritation: The skin irritation hazard is based on evaluation of data for product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for product components.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.

Carcinogenicity: The hazard evaluation is based on data for components or a similar material.

Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).
These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.
The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM OIL, N.E.C.; NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR
Additional Information: NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER ICAO

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:
Not applicable

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1.	Immediate (Acute) Health Effects:	NO
2.	Delayed (Chronic) Health Effects:	NO
3.	Fire Hazard:	NO
4.	Sudden Release of Pressure Hazard:	NO
5.	Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:
01-1=IARC Group 1 03=EPCRA 313

01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL (Gear oil)

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 0 Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:
Label Category : INDUSTRIAL OIL 1 - IND1

REVISION STATEMENT: This revision updates the following sections of this Safety Data Sheet: 1-16
Revision Date: APRIL 30, 2015

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
HMIS - Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to the 29 CFR 1910.1200 (2012) by Chevron Energy Technology Company, 6001

Bollinger Canyon Road San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Material Safety Data Sheet

1. Chemical product and company identification

Product name CASTROL TRIBOL 1510/680

MSDS# 72330-AG

Code 72330-AG

Product use Gear oils.

Manufacturer CASTROL INDUSTRIAL NORTH AMERICA INC.
1001 WEST 31ST STREET
DOWNERS GROVE, IL 60515-1280
TEL.: 1 - 630-241-4000 (USA)

Supplier CASTROL INDUSTRIAL NORTH AMERICA INC.
1001 West 31St Street
Downers Grove, IL 60515-1280
U.S.A.
1 (630) 241-4000 (USA)

EMERGENCY SPILL INFORMATION: 1 (800) 424-9300 CHEMTREC (USA)

2. Composition/information on ingredients

Ingredient name	CAS #	% by weight	Exposure limits
molybdenum, bis[O,O-bis(2-ethyl-hexyl)phosphorodithioatc	72030-25-2	1 - 5	**ACGIH TLV (United States, 2002).** TWA: 0.5 mg/m^3 8 hour(s). Form: Soluble TWA: 0.5 mg/m^3 8 hour(s). Form: Soluble **OSHA PEL (United States, 1993).** TWA: 5 mg/m^3 8 hour(s). **OSHA PEL 1989 (United States, 1989).** TWA: 5 mg/m^3 8 hour(s). Form: Soluble
Distillates (petroleum), hydrotreated, heavy paraffinic, or Distillates (petroleum), solvent-dewaxed heavy paraffinic, or Distillates (petroleum), solvent-refined heavy paraffinic	64741-88-4 &/or 64742-54-7 &/or 64742-65-0	1 - 5	**ACGIH (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Mist STEL: 10 mg/m^3 15 minute(s). Form: Mist **OSHA (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Mist

3. Hazards identification

Physical state Liquid.

Color Yellow.

Emergency overview WARNING

CAUSES EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

Avoid prolonged or repeated contact with skin. Keep container closed. Wash thoroughly after handling. Use with adequate ventilation. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

Routes of entry Skin Contact. Eye contact. Inhalation. Ingestion.

Potential Health Effects

Eyes Causes eye irritation.

Skin May cause skin irritation. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

Inhalation May cause respiratory tract irritation.

Ingestion Swallowing may have the following effects: discomfort (gastrointestinal) and diarrhea

Medical conditions aggravated by overexposure: None identified.

See toxicological Information (section 11)

4. First aid measures

Eye Contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops.

Skin Contact Immediately wash exposed skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

5. Fire-fighting measures

Flammability of the product May be combustible at high temperature.

Flash point 265 °C (Closed cup) Pensky-Martens.

Products of combustion These products are carbon oxides (CO, CO_2), sulfur oxides (SO_2, SO_3...), phosphates. Some metallic oxides.

Unusual fire/explosion hazards This material is not explosive as defined by established regulatory criteria.

This material is not explosive as defined by established regulatory criteria.

Fire fighting media and instructions In case of fire, use water fog, foam, dry chemicals, or CO2.

Protective clothing (fire) Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Special remarks on fire hazards None identified.

Special remarks on explosion hazards None identified.

6. Accidental release measures

Personal Precautions

Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Follow all fire fighting procedures (Section 5).

Environmental precautions and clean-up methods

If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Minimize contact of spilled material with soils to prevent runoff to surface waterways. See Section 13 for Waste Disposal Information.

Personal protection in case of a large spill

Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

7. Handling and storage

Handling

Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Wash thoroughly after handling. Use only with adequate ventilation. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable.

Storage

Keep container tightly closed. Keep container in a cool, well-ventilated area. Empty containers may contain harmful, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
molybdenum, bis[O,O-bis(2-ethyl-hexyl)phosphorodithioatc	**ACGIH TLV (United States, 2002).** TWA: 0.5 mg/m^3 8 hour(s). Form: Soluble TWA: 0.5 mg/m^3 8 hour(s). Form: Soluble **OSHA PEL (United States, 1993).** TWA: 5 mg/m^3 8 hour(s). **OSHA PEL 1989 (United States, 1989).** TWA: 5 mg/m^3 8 hour(s). Form: Soluble
Distillates (petroleum), hydrotreated, heavy paraffinic, or Distillates (petroleum), solvent-dewaxed heavy paraffinic, or Distillates (petroleum), solvent-refined heavy paraffinic	**ACGIH (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Mist STEL: 10 mg/m^3 15 minute(s). Form: Mist **OSHA (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Mist

Control Measures

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits.

Hygiene measures

Wash hands after handling compounds and before eating, smoking, using lavatory, and at the end of day.

Personal protection

Eyes

Avoid contact with eyes. Safety glasses with side shield or chemical goggles.

Skin and Body

Avoid contact with skin and clothing. Avoid prolonged or repeated contact with skin.

Respiratory

Use only with adequate ventilation.

Hands

Wear suitable gloves.

Consult local authorities for acceptable exposure limits.

9. Physical and chemical properties

Physical state	Liquid.
Odor	Characteristic.
Color	Yellow.
Solubility	Insoluble in cold water, hot water.
Viscosity	Kinematic: 680 mm^2/s (680 cSt) at 40°C

10. Stability and reactivity

Stability and Reactivity	The product is stable.
Conditions to avoid	None known.
Incompatibility with various substances	Strong oxidizing materials
Hazardous Decomposition Products	nitrogen oxides (NO, NO_2...) Carbon Dioxide (CO_2).
Hazardous polymerization	Will not occur.

11. Toxicological information

Ingredient name	Test	Result	Route	Species
Phenol, Nonyl-, Phosphite (3:1)	LD50	>2000 mg/kg	Oral	Rat

Chronic toxicity

Carcinogenic effects

No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH or the International Agency for Research on Cancer (IARC). No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).

Mutagenic effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a mutagen.

Reproductive effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a reproductive toxin.

Teratogenic effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

12. Ecological information

Ecotoxicity No testing has been performed by the manufacturer.

Persistence/degradability

Not determined.

13. Disposal considerations

Waste information Waste must be disposed of in accordance with federal, state and local environmental control regulations. Keep out of waterways. Disposal of this material to the land may be banned by federal law (40 CFR 268).

RCRA Waste Code(s) USED OIL

Consult your local or regional authorities.

14. Transport information

International transport regulations

Regulatory Information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	Not regulated.	-----	-----	Not available.		Not available.
TDG Classification	Not regulated.	-----	-----	Not available.		Not available.
IMDG Classification	Not available.	Not available.	Not available.	Not available.		Not available.
IATA Classification	Not available.	Not available.	Not available.	Not available.		Not available.

15. Regulatory information

U.S. Federal regulations US INVENTORY (TSCA): In compliance.

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	2-ethylhexyl zinc dithiophosphate	4259-15-8	2.3
Supplier notification	2-ethylhexyl zinc dithiophosphate	4259-15-8	2.3

State regulations New Jersey:2-ethylhexyl zinc dithiophosphate
Pennsylvania RTK:2-ethylhexyl zinc dithiophosphate (environmental hazard, generic environmental hazard)

California prop. 65: No products were found.

Inventories

AUSTRALIAN INVENTORY (AICS): Not determined.

CANADA INVENTORY (DSL): Not listed.

CHINA INVENTORY (IECS): Not determined.

EC INVENTORY (EINECS/ELINCS): In compliance.

JAPAN INVENTORY (ENCS): In compliance.

KOREA INVENTORY (ECL): In compliance.

PHILIPPINE INVENTORY (PICCS): In compliance.

16. Other information

Label Requirements

WARNING

CAUSES EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

HMIS® Rating :

Health	**1**
Flammability	**1**
Physical Hazard	**0**
Personal protection	**b**

National Fire Protection Association (U.S.A.)

Other special considerations

PETROLEUM OIL: STEL = 10 mg/M3. Using terminology of the International Agency for Research on Cancer (IARC), the petroleum distillates listed in Section II are classified by the supplier as severely processed. Not all those listed in Section II may be present. The supplier has stated that these distillates do not require a carcinogen label as defined by OSHA 29 CFR 1910.1200.

History

Date of issue 01/29/2004.

Date of previous issue 01/27/2004.

Prepared by Product Stewardship

Notice to reader

NOTICE : This Material Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. Despite our efforts, it may not be up to date or applicable to the circumstances of any particular case. We are not responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product.

This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1.

Material Safety Data Sheet

1. Chemical product and company identification

Product name CASTROL TRIBOL 1510/680

MSDS# 72330-AG

Code 72330-AG

Product use Gear oils.

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TEL.: 1 - 630-241-4000 (USA)

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1001 West 31St Street
Downers Grove, IL 60515-1280
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1 (630) 241-4000 (USA)

EMERGENCY SPILL INFORMATION: 1 (800) 424-9300 CHEMTREC (USA)

2. Composition/information on ingredients

Ingredient name	CAS #	% by weight	Exposure limits
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Distillates (petroleum), hydrotreated, heavy paraffinic, or Distillates (petroleum), solvent-dewaxed heavy paraffinic, or Distillates (petroleum), solvent-refined heavy paraffinic	64741-88-4 &/or 64742-54-7 &/or 64742-65-0	1 - 5	**ACGIH (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Mist STEL: 10 mg/m^3 15 minute(s). Form: Mist **OSHA (United States).** TWA: 5 mg/m^3 8 hour(s). Form: Mist

3. Hazards identification

Physical state Liquid.

Color Yellow.

Emergency overview WARNING

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MAY CAUSE SKIN IRRITATION.
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Routes of entry Skin Contact. Eye contact. Inhalation. Ingestion.

Potential Health Effects

Eyes Causes eye irritation.

Skin May cause skin irritation. Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

Inhalation May cause respiratory tract irritation.

Ingestion Swallowing may have the following effects: discomfort (gastrointestinal) and diarrhea

Medical conditions aggravated by overexposure: None identified.

See toxicological Information (section 11)

4. First aid measures

Eye Contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops.

Skin Contact Immediately wash exposed skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention if irritation develops.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

5. Fire-fighting measures

Flammability of the product May be combustible at high temperature.

Flash point 265 °C (Closed cup) Pensky-Martens.

Products of combustion These products are carbon oxides (CO, CO_2), sulfur oxides (SO_2, SO_3...), phosphates. Some metallic oxides.

Unusual fire/explosion hazards This material is not explosive as defined by established regulatory criteria.

This material is not explosive as defined by established regulatory criteria.

Fire fighting media and instructions In case of fire, use water fog, foam, dry chemicals, or CO2.

Protective clothing (fire) Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Special remarks on fire hazards None identified.

Special remarks on explosion hazards None identified.

6. Accidental release measures

Personal Precautions

Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Follow all fire fighting procedures (Section 5).

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If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal. Minimize contact of spilled material with soils to prevent runoff to surface waterways. See Section 13 for Waste Disposal Information.

Personal protection in case of a large spill

Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

7. Handling and storage

Handling

Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Wash thoroughly after handling. Use only with adequate ventilation. In accordance with good industrial hygiene and safety work practices, airborne exposures should be controlled to the lowest extent practicable.

Storage

Keep container tightly closed. Keep container in a cool, well-ventilated area. Empty containers may contain harmful, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose of containers unless adequate precautions are taken against these hazards.

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
molybdenum, bis[O,O-bis(2-ethyl-hexyl)phosphorodithioatc	**ACGIH TLV (United States, 2002).** TWA: 0.5 mg/m^3 8 hour(s). Form: Soluble TWA: 0.5 mg/m^3 8 hour(s). Form: Soluble **OSHA PEL (United States, 1993).** TWA: 5 mg/m^3 8 hour(s). **OSHA PEL 1989 (United States, 1989).** TWA: 5 mg/m^3 8 hour(s). Form: Soluble
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Control Measures

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits.

Hygiene measures

Wash hands after handling compounds and before eating, smoking, using lavatory, and at the end of day.

Personal protection

Eyes

Avoid contact with eyes. Safety glasses with side shield or chemical goggles.

Skin and Body

Avoid contact with skin and clothing. Avoid prolonged or repeated contact with skin.

Respiratory

Use only with adequate ventilation.

Hands

Wear suitable gloves.

Consult local authorities for acceptable exposure limits.

9. Physical and chemical properties

Physical state	Liquid.
Odor	Characteristic.
Color	Yellow.
Solubility	Insoluble in cold water, hot water.
Viscosity	Kinematic: 680 mm^2/s (680 cSt) at 40°C

10. Stability and reactivity

Stability and Reactivity	The product is stable.
Conditions to avoid	None known.
Incompatibility with various substances	Strong oxidizing materials
Hazardous Decomposition Products	nitrogen oxides (NO, NO_2...) Carbon Dioxide (CO_2).
Hazardous polymerization	Will not occur.

11. Toxicological information

Ingredient name	Test	Result	Route	Species
Phenol, Nonyl-, Phosphite (3:1)	LD50	>2000 mg/kg	Oral	Rat

Chronic toxicity

Carcinogenic effects

No component of this product at levels greater than 0.1% is identified as a carcinogen by ACGIH or the International Agency for Research on Cancer (IARC). No component of this product present at levels greater than 0.1% is identified as a carcinogen by the U.S. National Toxicology Program (NTP) or the U.S. Occupational Safety and Health Act (OSHA).

Mutagenic effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a mutagen.

Reproductive effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as a reproductive toxin.

Teratogenic effects

No component of this product at levels greater than 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

12. Ecological information

Ecotoxicity No testing has been performed by the manufacturer.

Persistence/degradability

Not determined.

13. Disposal considerations

Waste information Waste must be disposed of in accordance with federal, state and local environmental control regulations. Keep out of waterways. Disposal of this material to the land may be banned by federal law (40 CFR 268).

RCRA Waste Code(s) USED OIL

Consult your local or regional authorities.

14. Transport information

International transport regulations

Regulatory Information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	Not regulated.	-----	-----	Not available.		Not available.
TDG Classification	Not regulated.	-----	-----	Not available.		Not available.
IMDG Classification	Not available.	Not available.	Not available.	Not available.		Not available.
IATA Classification	Not available.	Not available.	Not available.	Not available.		Not available.

15. Regulatory information

U.S. Federal regulations US INVENTORY (TSCA): In compliance.

This product is not regulated under Section 302 of SARA and 40 CFR Part 355.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	2-ethylhexyl zinc dithiophosphate	4259-15-8	2.3
Supplier notification	2-ethylhexyl zinc dithiophosphate	4259-15-8	2.3

State regulations New Jersey:2-ethylhexyl zinc dithiophosphate
Pennsylvania RTK:2-ethylhexyl zinc dithiophosphate (environmental hazard, generic environmental hazard)

California prop. 65: No products were found.

Inventories

AUSTRALIAN INVENTORY (AICS): Not determined.

CANADA INVENTORY (DSL): Not listed.

CHINA INVENTORY (IECS): Not determined.

EC INVENTORY (EINECS/ELINCS): In compliance.

JAPAN INVENTORY (ENCS): In compliance.

KOREA INVENTORY (ECL): In compliance.

PHILIPPINE INVENTORY (PICCS): In compliance.

16. Other information

Label Requirements

WARNING

CAUSES EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
MAY CAUSE RESPIRATORY TRACT IRRITATION.

HMIS® Rating :

Health	**1**
Flammability	**1**
Physical Hazard	**0**
Personal protection	**b**

National Fire Protection Association (U.S.A.)

Other special considerations

PETROLEUM OIL: STEL = 10 mg/M3. Using terminology of the International Agency for Research on Cancer (IARC), the petroleum distillates listed in Section II are classified by the supplier as severely processed. Not all those listed in Section II may be present. The supplier has stated that these distillates do not require a carcinogen label as defined by OSHA 29 CFR 1910.1200.

History

Date of issue 01/29/2004.

Date of previous issue 01/27/2004.

Prepared by Product Stewardship

Notice to reader

NOTICE : This Material Safety Data Sheet is based upon data considered to be accurate at the time of its preparation. Despite our efforts, it may not be up to date or applicable to the circumstances of any particular case. We are not responsible for any damage or injury resulting from abnormal use, from any failure to follow appropriate practices or from hazards inherent in the nature of the product.

This Material Safety Data Sheet conforms to the requirements of ANSI Z400.1.

SAFETY DATA SHEET

Section 1. Identification

Product name Tribol 1710/320

SDS # 454400

Historic SDS #: 75861

Code 454400-US03

Relevant identified uses of the substance or mixture and uses advised against

Product use Gear lubricant .
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

Manufacturer Castrol Industrial North America, Inc.
150 W. Warrenville Road
Naperville, IL 60563

Supplier Castrol Industrial North America, Inc.
150 W. Warrenville Road
Naperville, IL 60563
Product Information: +1-877-641-1600

EMERGENCY SPILL INFORMATION: 1 (800) 424-9300 CHEMTREC (USA)

Section 2. Hazards identification

OSHA/HCS status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture SKIN SENSITIZATION - Category 1

GHS label elements

Hazard pictograms

Signal word Warning

Hazard statements May cause an allergic skin reaction.

Precautionary statements

Prevention Wear protective gloves. Avoid breathing vapor. Contaminated work clothing must not be allowed out of the workplace.

Response IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention.

Storage Not applicable.

Disposal Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified Defatting to the skin.

Section 3. Composition/information on ingredients

Poly-alpha-olefin. Highly refined mineral oil and additives.

Substance/mixture Mixture

Ingredient name	CAS number	%
Base oil - highly refined	Varies - See Key to abbreviations	≥10 - <25
Distillates (petroleum), hydrotreated, heavy paraffinic	64742-54-7	≥10 - <25
Zinc bis[O,O-bis(2-ethylhexyl)] bis(dithiophosphate)	4259-15-8	≥1 - <3
tris(nonylphenyl) phosphite	26523-78-4	≥0.3 - <1

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Skin contact In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention.

Inhalation If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Get medical attention if adverse health effects persist or are severe.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treatment should in general be symptomatic and directed to relieving any effects.

Specific treatments No specific treatment.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media Do not use water jet.

Specific hazards arising from the chemical In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products Combustion products may include the following:
carbon dioxide
carbon monoxide
sulfur oxides
phosphorus oxides

Section 5. Fire-fighting measures

Special protective actions for fire-fighters
Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters
Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Special remarks on explosion hazards
None identified.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling. Contact emergency personnel.

For emergency responders
Entry into a confined space or poorly ventilated area contaminated with vapor, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus. Wear a suitable chemical protective suit. Chemical resistant boots. See also the information in "For non-emergency personnel".

Environmental precautions
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill
Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill
Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Contaminated absorbent material may pose the same hazard as the spilled product. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures
Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Avoid breathing vapor or mist. Do not ingest. Empty containers retain product residue and can be hazardous. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Do not reuse container. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used.

Advice on general occupational hygiene
Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities
Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Base oil - highly refined	**ACGIH TLV (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 11/2009 Form: Inhalable fraction **OSHA PEL (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 6/1993
Distillates (petroleum), hydrotreated, heavy paraffinic	**ACGIH TLV (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 11/2009 Form: Inhalable fraction **OSHA PEL (United States).** TWA: 5 mg/m³ 8 hours. Issued/Revised: 6/1993
Zinc bis[O,O-bis(2-ethylhexyl)] bis(dithiophosphate)	None.
tris(nonylphenyl) phosphite	None.

While specific OELs for certain components may be shown in this section, other components may be present in any mist, vapor or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained. Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

Hand protection

Wear suitable gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Consult your supervisor or Standard Operating Procedure (S.O.P) for special handling instructions.

Section 8. Exposure controls/personal protection

Body protection

Use of protective clothing is good industrial practice.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Section 9. Physical and chemical properties

Appearance

Physical state Liquid.

Color Clear Dark Amber.

Odor Mild.

Odor threshold Not available.

pH Not available.

Melting point Not available.

Boiling point Not available.

Flash point Open cup: 266°C (510.8°F) [Cleveland.]

Evaporation rate Not available.

Flammability (solid, gas) Not applicable. Based on - Physical state

Lower and upper explosive (flammable) limits Not available.

Vapor pressure Not available.

Vapor density Not available.

Density <1000 kg/m³ (<1 g/cm³) at 15.6°C

Solubility insoluble in water.

Partition coefficient: n-octanol/water Not available.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Kinematic: 320 mm^2/s (320 cSt) at 40°C

Section 10. Stability and reactivity

Reactivity

No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.

Chemical stability

The product is stable.

Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.
Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid

Avoid all possible sources of ignition (spark or flame).

Section 10. Stability and reactivity

Incompatible materials Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Aspiration hazard

Name	Result
Distillates (petroleum), hydrotreated, heavy paraffinic	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure Routes of entry anticipated: Dermal, Inhalation.

Potential acute health effects

Eye contact No known significant effects or critical hazards.

Skin contact May cause an allergic skin reaction.

Inhalation Vapor inhalation under ambient conditions is not normally a problem due to low vapor pressure.

Ingestion No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact No specific data.

Skin contact Adverse symptoms may include the following:
irritation
redness
dryness
cracking

Inhalation No specific data.

Ingestion No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

Long term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

Potential chronic health effects

General No known significant effects or critical hazards.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 11. Toxicological information

Section 12. Ecological information

Toxicity

No testing has been performed by the manufacturer.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) Not available.

Other adverse effects No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	**Special provisions** NOT REGULATED	-	-	-

Special precautions for user Not available.

Section 14. Transport information

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not available.

Section 15. Regulatory information

U.S. Federal regulations

United States inventory (TSCA 8b) All components are listed or exempted.

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 311/312

Classification Immediate (acute) health hazard

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	Zinc bis[O,O-bis(2-ethylhexyl)] bis (dithiophosphate)	4259-15-8	1.6 - 2
Supplier notification	Zinc bis[O,O-bis(2-ethylhexyl)] bis (dithiophosphate)	4259-15-8	1.6 - 2

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts None of the components are listed.

New Jersey The following components are listed: MINERAL OIL (UNTREATED and MILDLY TREATED); ZINC compounds

Pennsylvania The following components are listed: ZINC COMPOUNDS

California Prop. 65 **WARNING:** This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
Toluene

Other regulations

Australia inventory (AICS) All components are listed or exempted.

Canada inventory All components are listed or exempted.

China inventory (IECSC) All components are listed or exempted.

Japan inventory (ENCS) All components are listed or exempted.

Korea inventory (KECI) All components are listed or exempted.

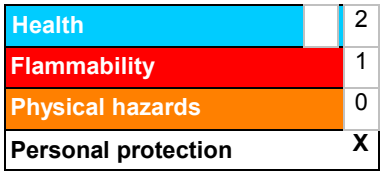
Philippines inventory (PICCS) At least one component is not listed.

Taiwan inventory (CSNN) All components are listed or exempted.

REACH Status For the REACH status of this product please consult your company contact, as identified in Section 1.

Section 16. Other information

Hazardous Material Information System (U.S.A.)



Section 16. Other information

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

National Fire Protection Association (U.S.A.)

History

Date of issue/Date of revision 09/11/2015.

Date of previous issue 03/17/2015.

Key to abbreviations

ACGIH = American Conference of Industrial Hygienists
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS Number = Chemical Abstracts Service Registry Number
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
OEL = Occupational Exposure Limit
SDS = Safety Data Sheet
STEL = Short term exposure limit
TWA = Time weighted average
UN = United Nations
UN Number = United Nations Number, a four digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods.
Varies = may contain one or more of the following 101316-69-2, 101316-70-5, 101316-71-6, 101316-72-7, 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64741-97-5, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-64-9, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1, 74869-22-0, 90669-74-2

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

AIRTECH
ADVANCED MATERIALS GROUP

MATERIAL SAFETY DATA SHEET

Wrightlon 3900 – Issue Date: August 1, 2013

SECTION I - PRODUCT IDENTIFICATION

Trade Name: **Wrightlon® 3900**
Product Class: Film manufactured from polyolefins
Supplier: **Airtech International, Inc.**
5700 Skylab Road
Huntington Beach, CA 92647
Telephone: 714-899-8100
Fax: 714-899-8179

Emergency Telephone: **800-424-9300**

Hazardous Ingredients: None

SECTION II – HAZARDS IDENTIFICATION

Emergency Overview:
This product is a plastic film. It is not considered hazardous under normal usage. It can release irritating and/or toxic vapors from overheating or if involved in a fire.

SECTION III – FIRST AID MEASURES

Skin:
If molten polymer contacts skin, cool rapidly with cold water. Do not attempt to peel polymer from skin. Obtain medical attention for thermal burn.
Eyes:
None needed under normal usage. If material comes in contact with eye, flush eyes with water while holding eyelids apart.
Inhalation:
None needed under normal usage. Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. Consult a physician after significant exposure.

SECTION IV – FIRE FIGHTING MEASURES

Suitable extinguishing media:
Water, carbon dioxide, foam, dry chemical.
Special protective equipment:
In the event of fire, wear an approved positive pressure self-contained breathing apparatus and full protective clothing.

SECTION V – MEASURES TO BE TAKEN IN THE EVENT OF ACCIDENTAL SPILLAGE

Cleaning methods:
Collect and store into containers for disposal.

SECTION VI – HANDLING AND STORAGE

Handling:
Good industrial practice in housekeeping should be followed.
Storage:
Store in a cool, dry area, away from direct sunlight, at 20-25°C and 50-55% relative humidity. Keep original packaging tightly closed until use to prevent contamination.

SECTION VII – EXPOSURE CONTROLS / PERSONAL PROTECTION

Technical measures:
Overall room ventilation and/or local exhaust at points of fume generation.
Respiratory protection:
None under normal usage if proper ventilation.
Skin protection:
Protective gloves are required when handling hot material.
Eye and face protection:
Use safety glasses as a good general safety practice.
Hygiene measures:
Wash hands before handling food.
Control parameters:
None known.

SECTION VIII – PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Thin pink film or sheet
Odor:	Plastic odor
pH:	Not applicable
Solubility in water:	Insoluble
Melting point:	155-165°C
Flash point (estimated):	> 343°C
Auto-ignition temperature (estimated):	> 500°C
Specific gravity:	0.90-0.905

SECTION IX – STABILITY AND REACTIVITY

Stability:
The preparation is stable at the storage conditions recommend per § 7 of the safety data sheet and under normal use conditions.
Conditions to avoid:
Heating above 220°C
Materials to avoid: None known.
Hazardous decomposition products:
Combustions may produce carbon monoxide, carbon dioxide, acids, ketones, aldehydes and other organic oxidation products.

SECTION X – TOXICOLOGICAL INFORMATION

No toxicological data on the product itself is available.

SECTION XI – ECOLOGICAL INFORMATION

No ecological data on the product itself is available. Aquatic toxicity is expected to be low based on insolubility in water.

SECTION XII – DISPOSAL CONSIDERATIONS

Like most thermoplastics, the product can be recycled. Where possible recycling is preferred to landfill or incineration. Disposal must be done in compliance with local regulations.

European waste code (CED): 070213

SECTION XIII – TRANSPORT INFORMATION

Not classified as hazardous under transport regulations (ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport).

SECTION XIV – REGULATORY INFORMATION

This product was classified in compliance with the directives 88/379/EC and their adaptations. Not subject to labeling according to EC directives.

USER'S RESPONSIBILITY

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of your operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin should be provided to your employees or customers. It is your responsibility to use this information to develop appropriate work practice guidelines and employee instructional programs for your operation.

DISCLAIMER OF LIABILITY

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CORPORATE HEADQUARTERS
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Internet: http://www.airtechintl.com
e-mail: airtech airtechintl.com

1 PRODUCT AND COMPANY IDENTIFICATION

Manufacturer

Ranbar Electrical Materials, Inc.
408 Manor-Harrison City Rd.
Harrison City, PA 15636

Vendor

Emergency:	Chemtrec 1-800-424-9300 CC 18429
Phone:	724-864-8200
Fax:	724-864-8232
Web:	www.ranbar.com

Product Name:	U2020 Ultimeg 2020 Base
Revision Date:	5/26/15
Version:	1
SDS Number:	U2020
Common Name:	Electrical Varnish
Product Code:	U2020
Product Use:	Electrical Coatings

2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS):

Health, Skin corrosion/irritation, 2
Health, Serious Eye Damage/Eye Irritation, 2 A
Health, Respiratory or skin sensitization, 1 Skin
Environmental, Hazards to the aquatic environment - Chronic, 2

GHS Label elements, including precautionary statements

GHS Signal Word: WARNING

GHS Hazard Pictograms:

GHS Hazard Statements:

H315 - Causes skin irritation
H319 - Causes serious eye irritation
H317 - May cause an allergic skin reaction
H411 - Toxic to aquatic life with long lasting effects

GHS Precautionary Statements:

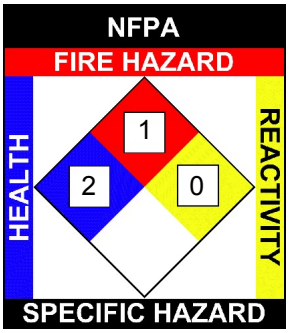
P261 - Avoid breathing mist/spray.
P273 - Avoid release to the environment.
P302+352 - IF ON SKIN: Wash with soap and water.
P305+351+338 - IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P264 - Wash skin thoroughly after handling.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P321 - Specific treatment (see information on this label).
P333+313 - If skin irritation or a rash occurs: Get medical advice/attention.
P337 - If eye irritation persists: Get medical advice/attention.

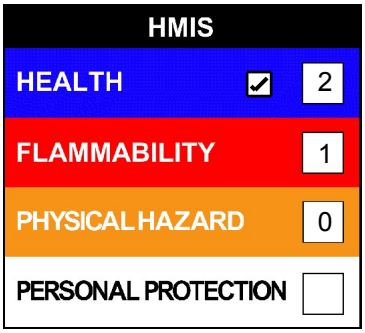
P362 - Take off contaminated clothing and wash before reuse.
P501 - Dispose of contents/container to approved disposal facility.

Hazards not otherwise classified (HNOC) or not covered by GHS

Route of Entry:	Eyes; Ingestion; Inhalation; Skin;
Target Organs:	Eyes; Skin; Respiratory system; Cental nervous system; Kidneys.
Inhalation:	Slightly irritating to the respiratory system.
Skin Contact:	If contact with heated liquid (140 F) treat for thermal burns. At room temperature, contact may cause mild skin irritation including redness, burning, and drying and cracking of skin.
Eye Contact:	Irritating to eyes. Heated material can cause thermal burns.
Ingestion:	Not expected to be harmful under normal conditions of use.

NFPA: Health = 2, Fire = 1, Reactivity = 0, Specific Hazard = n/a
HMIS III: Health = 2(Chronic), Fire = 1, Physical Hazard = 0
HMIS PPE: - Consult your supervisor for special instructions





3 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients:

Cas	%	Chemical Name
0	90-95%	Epoxy Resin Proprietary
68609-97-2	5-10%	Alkyl Glycidyl Ether

4 FIRST AID MEASURES

Inhalation:	If inhaled, move person to fresh air. If not breathing, give artificial respiration. Consult a physician.
Skin Contact:	Wash with soap and water. Consult a physician if irritation continues.
Eye Contact:	Immediately flush with clear water for 15 minutes, including under eyelids. Consult a doctor.
Ingestion:	Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5 FIRE FIGHTING MEASURES

Flammability:	Not Flammable, however product will support combustion.
Flash Point:	>300 F (148 C)
Flash Point Method:	Closed Cup (Seta)
Autoignition Temp:	Not available.
LEL:	N/A
UEL:	N/A

Conditions to avoid: Heat, sparks, flame, red hot metal. Extinguishing Media: CO2, dry chemical, or universal aqueous film forming foam. Hazardous Combustion Products: Oxides of Carbon (CO, CO2), smoke and vapors. Unsuitable Extinguishing Media: Water Jet or water based fire extinguishers. Use water spray to cool fire exposed containers as contents can rupture violently from heat developed pressure.

Fireman should wear self contained breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

Use personal protection recommended for this material.
Isolate hazard area and deny entry to unnecessary and unprotected personnel.
Keep out of drains, sewers, ditches, and waterways. Avoid use of water.
Released content may be contained with oil/solvent absorbant pads, booms, and or absorbants.
Avoid breathing vapors and ventilate area well.
Remove sources of ignition and use non-sparking equipment.
Soak up material with inert absorbant and place in safety containers for proper disposal.
Prohibited Cleanup Materials: Combustible absorbent materials such as sawdust, and use of equipment that may cause sparking.
Report releases that reach surface water or groundwater in any amount.
Spills, leaks and overfills from underground regulated storage tanks should also be reported.
Reportable quantities for spills onto the ground depend on site conditions such as type of soil and material spilled.
Consult your local regulatory agency if unsure of reporting requirements.

7 HANDLING AND STORAGE

Handling Precautions:	Avoid breathing vapors or mist. Avoid contact with eyes, skin, or clothing. Consider normal working hygiene. Do not expose containers to open flame, excessive heat, or direct sunlight. Do not puncture or drop containers. Handle with care and avoid spillage on the floor (slippage). Keep away from sources of ignition. Keep material out of reach of children. Launder contaminated clothing. Use approved containers only.
Storage Requirements:	Keep containers tightly closed and stored in a well ventilated area.

8 E POSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	Use with adequate ventilation. General ventilation (typically 10 air changes per hour) should be used. Rates should be matched to conditions. Local exhaust ventilation or an enclosed handling system may be necessary to control air contamination below that of the lowest OEL.
Personal Protective Equipment:	HMIS PP, Consult your supervisor for special instructions Chemical resistant gloves; Chemical safety glasses; NIOSH approved respirator; Organic vapor respirator with dust, mist, and fume filters;

Alkyl Glycidyl Ether (68609-97-2) [5-10%] : no data available

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear liquid.		
Physical State:	Liquid	Odor:	Epoxide type.
Spec Grav./Density:	Specific Gravity: 1.14 g/ml	Solubility:	Slightly soluble in water.
Viscosity:	Mobile liquid.	Percent Volatile:	0 %
Boiling Point:	>390 F (199 C)	Freezing/Melting Pt.:	Not available.
Flammability:	Not Flammable.	Flash Point:	>300 F (148 C)
Partition Coefficient:	Not available.	Vapor Density:	N/A
Vapor Pressure:	N/A	VOC:	0 %
pH:	Not available.	Auto-Ignition Temp:	Not available
Evap. Rate:	N/A		
Decomp Temp:	Not available.		

Weight per Gallon: 9.51 lbs/gal

10 STABILITY AND REACTIVITY

Stability:	Product is stable under normal conditions.
Conditions to Avoid:	Sources of ignition. Heat, sparks, flame, red hot metal.
Materials to Avoid:	Strong Oxidizing Agents, acids, amines, bases.
Hazardous Decomposition:	Oxides of carbon (C0, CO2).
Hazardous Polymerization:	Will not occur.

11 TO ICOLOGICAL INFORMATION

Alkyl Glycidyl Ether (68609-97-2) [5-10%]

Information on toxicological effects

Acute toxicity:
Oral LD50 no data available
Inhalation LC50
Dermal LD50
Other information on acute toxicity

Skin corrosion/irritation: no data available

Serious eye damage/eye irritation: no data available

Respiratory or skin sensitization: May cause sensitization by skin contact.

Germ cell mutagenicity: no data available

Carcinogenicity:
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available

Teratogenicity: no data available

Specific target organ toxicity - single exposure (Globally Harmonized System):
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System):
no data available

Aspiration hazard: no data available

Potential health effects: Inhalation May be harmful if inhaled. Causes respiratory tract irritation. Ingestion May be harmful if swallowed. Skin May be harmful if absorbed through skin. Causes skin irritation. Eyes Causes eye irritation.

Signs and Symptoms of Exposure: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated., Dermatitis

Synergistic effects: no data available

Additional Information:

RTECS: RR0562500

12 ECOLOGICAL INFORMATION

Alkyl Glycidyl Ether (68609-97-2) [5-10%]

Information on ecological effects

Toxicity: no data available

Persistence and degradability: no data available

Bioaccumulative potential: no data available

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: no data available

13 DISPOSAL CONSIDERATIONS

Hazard characteristics and waste stream classification can change with product use and location. It is the resposibility of the user to determine the proper storage, transportation, treatment, and/or disposal methodologies for spent materials and residues at the time of disposition. All waste material must be disposed of in compliance with respective national, federal, state, and local regulations. Consult with your local landfill to determine if empty small containers can be disposed of in regular trash pickup. Containers holding flammable or combustible liquid residues and vapors may be considered dangerous. Do not pressurize, weld, braze, cut, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity or other sources of ignition. Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner. For disposal of large containers (10 gal or larger), or for containers not suitable for landfill, consult a local drum reconditioner. All other containers should be disposed of in accordance with governmental regulations.

14 TRANSPORT INFORMATION

DOT Shipping Information:

United States (Domestic):

Bulk Quantities (119 gallons (450 liters)or greater):
Non-Regulated Liquid

Drum Size Quantities (less that 119 gallons (450 liters)):
Non-Regulated Liquid

International and IATA Shipments:

Bulk:
UN3082, Environmentally Hazardous Substance Liquid, NOS, 9, PGIII (Bisphenol A and Epoxy Resin)

Drums:
UN3082, Environmentally Hazardous Substance Liquid, NOS, 9, PGIII (Bisphenol A and Epoxy Resin)

Not a Marine Pollutant

15 REGULATORY INFORMATION

Component (CAS) [%] - CODES

Epoxy Resin Proprietary (0) 90-95%] TSCA, DSL

Alkyl Glycidyl Ether (68609-97-2) [5-10%] TSCA, DSL

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Regulatory CODE Descriptions
-----------------------------------------------------------------
TSCA = Toxic Substances Control Act
DSL = Canadian Domestic Substances List
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16 OTHER INFORMATION

Disclaimer:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user s intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

1 PRODUCT AND COMPANY IDENTIFICATION

Manufacturer

Ranbar Electrical Materials, Inc.
408 Manor-Harrison City Rd.
Harrison City, PA 15636

Vendor

Emergency:	Chemtrec 1-800-424-9300 CC 18429
Phone:	724-864-8200
Fax:	724-864-8232
Web:	www.ranbar.com

Product Name:	U2020 Ultimeg U2020 Hardener
Revision Date:	5/26/15
Version:	1
SDS Number:	U2020 Hardener
Common Name:	Epoxy Hardener
Product Code:	U2020 Hardener
Product Use:	Paints and Varnishes

2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS):

- Health, Serious Eye Damage/Eye Irritation, 1
- Health, Skin corrosion/irritation, 1 B
- Health, Acute toxicity, 1 Inhalation
- Environmental, Hazards to the aquatic environment - Chronic, 1
- Health, Respiratory or skin sensitization, 1 Skin
- Health, Reproductive toxicity, 2
- Health, Specific target organ toxicity - Single exposure, 3
- Health, Acute toxicity, 4 Dermal
- Health, Acute toxicity, 4 Oral

GHS Label elements, including precautionary statements

GHS Signal Word: DANGER

GHS Hazard Pictograms:

GHS Hazard Statements:

- H318 - Causes serious eye damage
- H314 - Causes severe skin burns and eye damage
- H330 - Fatal if inhaled
- H410 - Very toxic to aquatic life with long lasting effects
- H317 - May cause an allergic skin reaction
- H361 - Suspected of damaging fertility or the unborn child
- H336 - May cause drowsiness or dizziness
- H312 - Harmful in contact with skin
- H302 - Harmful if swallowed

GHS Precautionary Statements:

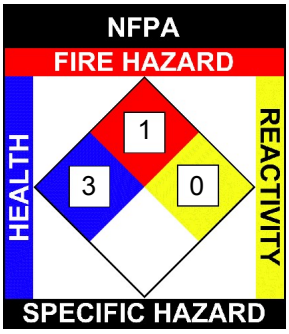
- P260 - Do not breathe dust/fume/gas/mist/vapors/spray.

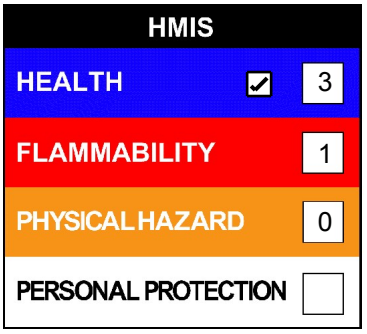
P270 - Do not eat, drink or smoke when using this product.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P284 - Wear respiratory protection.
P301+312 - IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P301+330+331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+361+353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+351+338 - IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P310 - Immediately call a POISON CENTER or doctor/physician.
P333+313 - If skin irritation or a rash occurs: Get medical advice/attention.
P363 - Wash contaminated clothing before reuse.
P391 - Collect spillage.
P501 - Dispose of contents/container to approved disposal facility.

Hazards not otherwise classified (HNOC) or not covered by GHS

Route of Entry:	Eyes; Ingestion; Inhalation; Skin;
Target Organs:	Eyes; Skin; Respiratory system; Cental nervous system; Kidneys.
Inhalation:	May cause severe irritation to respiratory tract, with coughing, nausea and sore throat. Chemicals of this type may cause sensitization upon prolonged or repeated exposure.
Skin Contact:	Corrosive. Chemicals of this type may cause sensitization upon prolonged or repeated exposure. Material may be absorbed through the skin.
Eye Contact:	Corrosive to eyes. May cause permanent damage and blindness. Vapors can cause a non-permanent vision problem of seeing "halos" or a "blue haze."
Ingestion:	Corrosive to gastrointestinal tract.

NFPA: Health = 3, Fire = 1, Reactivity = 0, Specific Hazard = n/a
HMIS III: Health = 3(Chronic), Fire = 1, Physical Hazard = 0
HMIS PPE: - Consult your supervisor for special instructions





3 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients:

Cas	%	Chemical Name
4067-16-7	36-50%	3,6,9,12-Tetraazatetradecane-1,14-diamine
80-05-7	1-5%	4,4 -Isopropylidenediphenol
111-40-0	10-30%	Diethylene triamine
25154-52-3	1-5%	Nonylphenol
2855-13-2	36-50%	Isophoronediamine

4 FIRST AID MEASURES

Inhalation: If inhaled, move person to fresh air. If not breathing, give artificial respiration. Consult a physician.
Skin Contact: Take off contimated clothing and shoes immediately. Wash with soap and water. Consult a physician.

Eye Contact: Immediately flush with clear water for 15 minutes, including under eyelids. Continue rinsing eyes during transport to hospital. Consult a doctor.

Ingestion: Do not induce vomiting. Never give anything by mouth to an unconsious person. Rinse mouth with water. Consult a physician.

5 FIRE FIGHTING MEASURES

Flammability:	Not Flammable.
Flash Point:	>200 F (93 C)
Flash Point Method:	Closed Cup (Seta)
Autoignition Temp:	Not available.
LEL:	N/A
UEL:	N/A

Conditions to avoid: Heat, sparks, flame, red hot metal. Extinguishing Media: CO2, dry chemical, or universal aqueous film forming foam. Hazardous Combustion Products: Oxides of Carbon (CO, CO2), smoke and vapors. Unsuitable Extinguishing Media: Water Jet or water based fire extinguishers. Use water spray to cool fire exposed containers as contents can rupture violently from heat developed pressure. Fireman should wear self contained breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

Use personal protection recommended for this material.
Isolate hazard area and deny entry to unnecessary and unprotected personnel.
Keep out of drains, sewers, ditches, and waterways. Avoid use of water.
Released content may be contained with oil/solvent absorbant pads, booms, and or absorbants.
Avoid breathing vapors and ventilate area well.
Soak up material with inert absorbant and place in safety containers for proper disposal.
Report releases that reach surface water or groundwater in any amount.
Spills, leaks and overfills from underground regulated storage tanks should also be reported.
Reportable quantities for spills onto the ground depend on site conditions such as type of soil and material spilled.
Consult your local regulatory agency if unsure of reporting requirements.

7 HANDLING AND STORAGE

Handling Precautions:	Avoid breathing vapors or mist. Avoid contact with eyes, skin, or clothing. Consider normal working hygiene. Do not expose containers to open flame, excessive heat, or direct sunlight. Do not puncture or drop containers. Handle with care and avoid spillage on the floor (slippage). Keep away from sources of ignition. Keep material out of reach of children. Launder contaminated clothing. Use approved containers only.
Storage Requirements:	Use appropriate grounding when filling and transfering containers. Keep containers tightly closed and stored in a well ventilated area.

8 E POSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	Use with adequate ventilation. General ventilation (typically 10 air changes per hour) should be used. Rates should be matched to conditions. Local exhaust ventilation or an enclosed handling system may be necessary to control air contamination below that of the lowest OEL.
Personal Protective Equipment:	HMIS PP, Consult your supervisor for special instructions Chemical resistant gloves; Chemical safety glasses; NIOSH approved respirator; Organic vapor respirator with dust, mist, and fume filters;

3,6,9,12-Tetraazatetradecane-1,14-diamine (4067-16-7) [36-50%] : no data available

4,4 -Isopropylidenediphenol (80-05-7) [1-5%] : no data available

Diethylene triamine (111-40-0) [10-30%]

Components with workplace control parameters

TWA 1 ppm USA. ACGIH Threshold Limit Values (TLV)
Eye & Upper Respiratory Tract irritation Danger of cutaneous absorption

TWA 1 ppm USA. NIOSH Recommended Exposure Limits
4 mg/m3
Potential for dermal absorption

TWA 1 ppm USA. OSHA - TABLE Z-1 Limits for Air Contaminants -
4 mg/m3 1910.1000

Isophoronediamine (2855-13-2) [36-50%] : no data available

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Clear colorless liquid.		
Physical State:	Liquid	Odor:	Ammoniacal
Spec Grav./Density:	Specific Gravity: 0.98 g/ml	Solubility:	Miscible
Viscosity:	Comparable to water.	Percent Volatile:	0%
Boiling Point:	>392 F (200 C)	Freezing/Melting Pt.:	Not available.
Flammability:	Not Flammable.	Flash Point:	> 200 F (93 C)
Partition Coefficient:	Not available.	Vapor Density:	13.3 mPa
Vapor Pressure:	0.02 mbar at 20C	VOC:	0%
pH:	11.5-12	Auto-Ignition Temp:	Not available
Evap. Rate:	N/A		
Decomp Temp:	Not available.		

Weight per Gallon: 8.17 lbs/gal

10 STABILITY AND REACTIVITY

Stability:	Product is stable under normal conditions.
Conditions to Avoid:	Sources of ignition. Heat, sparks, flame, red hot metal.
Materials to Avoid:	Strong Oxidizing Agents, acids
Hazardous Decomposition:	Oxides of carbon (C0, CO2).
Hazardous Polymerization:	Will not occur.

11 TO ICOLOGICAL INFORMATION

3,6,9,12-Tetraazatetradecane-1,14-diamine (4067-16-7) [36-50%]

Information on toxicological effects

Acute toxicity:

LD50 Oral - rat - 1,600 mg/kg
Inhalation: no data available

LD50 Dermal - rabbit - 1,465.4 mg/kg (OECD Test Guideline 402)

Skin corrosion/irritation: Skin - rabbit Result: Causes burns.

(OECD Test Guideline 404)

Serious eye damage/eye irritation: Eyes - rabbit Result: Corrosive to eyes

Respiratory or skin sensitisation: Buehler Test - guinea pig May cause sensitisation by skin contact. (OECD Test Guideline 406)

Germ cell mutagenicity: no data available

Carcinogenicity:
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available

Specific target organ toxicity - single exposure: no data available

Specific target organ toxicity - repeated exposure: no data available

Aspiration hazard: no data available

Additional Information:

RTECS: RZ2680000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

4,4 -Isopropylidenediphenol (80-05-7) [1-5%]

Information on toxicological effects

Acute toxicity:
Oral LD50 LD50 Oral - rat - 5,000 mg/kg
LD50 Oral - rat - male and female - > 2,000 - 5,000 mg/kg
Inhalation LC50 Dermal LD50
LD50 Dermal - rabbit - 3,000 mg/kg
Other information on acute toxicity no data available

Skin corrosion/irritation: Skin - rabbit - Mild skin irritation - 24 h

Serious eye damage/eye irritation: Eyes - rabbit - Severe eye irritation - 24 h

Respiratory or skin sensitisation: May cause allergic skin reaction.

Germ cell mutagenicity: no data available

Carcinogenicity:
This product is or contains a component that is probably not carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Teratogenicity: Suspected human reproductive toxicant

Specific target organ toxicity - single exposure (Globally Harmonized System):
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System):
no data available

Aspiration hazard: no data available

Potential health effects: Inhalation May be harmful if inhaled. Causes respiratory tract irritation. Ingestion May be harmful if swallowed. Skin May be harmful if absorbed through skin. Causes skin irritation. Eyes Causes eye irritation.

Signs and Symptoms of Exposure: To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects: no data available

Additional Information:

RTECS: SL6300000

Diethylene triamine (111-40-0) [10-30%]

Information on toxicological effects

Acute toxicity:
Oral LD50 LD50 Oral - rat - 1,080 mg/kg Remarks: Behavioral:Convulsions or effect on seizure threshold.
Inhalation LC50 LC50 Inhalation - rat - 4 h - 0.3 mg/l Remarks: Lungs, Thorax, or Respiration:Acute pulmonary edema.
Dermal LD50 LD50 Dermal - rabbit - 1,090 mg/kg
Other information on acute toxicity no data available

Skin corrosion/irritation: Skin - rabbit - Open irritation test

Serious eye damage/eye irritation: no data available

Respiratory or skin sensitization: no data available

May cause allergic skin reaction.

Germ cell mutagenicity: no data available

Carcinogenicity:
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by

OSHA.

Reproductive toxicity: no data available

Teratogenicity: no data available

Specific target organ toxicity - single exposure (Globally Harmonized System):
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure (Globally Harmonized System):
no data available

Aspiration hazard: no data available

Potential health effects: Inhalation May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Ingestion Harmful if swallowed. Skin Harmful if absorbed through skin. Causes skin burns. Eyes Causes eye burns.

Signs and Symptoms of Exposure: Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea

Synergistic effects: no data available

Additional Information:

RTECS: IE1225000

Isophoronediamine (2855-13-2) [36-50%]

Information on toxicological effects

Acute toxicity:
Oral LD50 LD50 Oral - rat - 1,030 mg/kg
Inhalation LC50 no data available
Dermal LD50 Other information on acute toxicity

Skin corrosion/irritation: Skin - rabbit - Skin irritation

Serious eye damage/eye irritation: Eyes - rabbit - Corrosive to eyes

Respiratory or skin sensitisation: May cause allergic skin reaction.

Causes sensitisation.

Germ cell mutagenicity: no data available

Carcinogenicity:
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity: no data available

Teratogenicit

Specific target organ toxicity - single exposure (Globally Harmonized System):
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System):
no data available
Aspiration hazar

Potential health effects: Inhalation May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Ingestion Harmful if swallowed. Skin Harmful if absorbed through skin. Causes skin burns. Eyes Causes eye burns.

Synergistic effects: no data available

Additional Informatio RTECS: GV5020833

12 ECOLOGICAL INFORMATION

3,6,9,12-Tetraazatetradecane-1,14-diamine (4067-16-7) [36-50%]

Information on ecological effects

Toxicity:
Toxicity to fish LC50 - Poecilia reticulata (guppy) - 0.18 mg/l - 96.0 h.
NOEC - Poecilia reticulata (guppy) - 0.32 mg/l - 96 h

Persistence and degradability: Biodegradability Result: - rapidly biodegradable

Bioaccumulative potential: no data available

Mobility in soil: no data available

Results of PBT and vPvB assessment PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic life with long lasting effects.

4,4 -Isopropylidenediphenol (80-05-7) [1-5%]

Information on ecological effects

Toxicity:
Toxicity to fish flow-through test LC50 - Cyprinodon variegatus (sheepshead minnow) - 11 mg/l - 96 h.
Method: OECD Test Guideline 203
Toxicity to daphnia static test EC50 - Daphnia magna (Water flea) - 10.2 mg/l - 48 h.
and other aquatic invertebrates
Toxicity to algae static test EC50 - Pseudokirchneriella subcapitata (green algae) - 2.73 - 3.1 mg/l - 96 h.

Persistence and degradability: Biodegradability aerobic Result: 89 % - Readily biodegradable.

Bioaccumulative potential: Bioaccumulation Cyprinus carpio (Carp) - 42 d Bioconcentration factor (BCF): 20 - 67

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unp rofessional handling or disposal.

Toxic to aquatic life.
no data available

Diethylene triamine (111-40-0) [10-30%]

Information on ecological effects

Toxicity:
Toxicity to fish LC50 - Poecilia reticulata (guppy) - 1,014 mg/l - 96 h.

Persistence and degradability: no data available

Bioaccumulative potential: no data available

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: no data available

Isophoronediamine (2855-13-2) [36-50%]

Information on ecological effects

Toxicity:
Toxicity to fish LC50 - Leuciscus idus (Golden orfe) - 110 mg/l - 96.0 h.
Toxicity to daphnia EC50 - Daphnia magna (Water flea) - 17.4 mg/l - 48 h.
and other aquatic invertebrates
Toxicity to algae EC50 - Desmodesmus subspicatus (green algae) - 37 mg/l - 72 h.

Persistence and degradability: no data available

Bioaccumulative potential: no data available

Mobility in soil: no data available

PBT and vPvB assessment: no data available

Other adverse effects: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic life.

13 DISPOSAL CONSIDERATIONS

Hazard characteristics and waste stream classification can change with product use and location. It is the resposibility of the user to determine the proper storage, transportation, treatment, and/or disposal methodologies for spent materials and residues at the time of disposition. All waste material must be disposed of in compliance with respective national, federal, state, and local regulations. Consult with your local landfill to determine if empty small containers can be disposed of in regular trash pickup. Containers holding flammable or combustible liquid residues and vapors may be considered dangerous. Do not pressurize, weld, braze, cut, solder, drill, grind or expose

such containers to heat, flame, sparks, static electricity or other sources of ignition. Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner. For disposal of large containers (10 gal or larger), or for containers not suitable for landfill, consult a local drum reconditioner. All other containers should be disposed of in accordance with governmental regulations.

14 TRANSPORT INFORMATION

UN2735, Amines, liquid, corrosive, n.o.s, or Polyamines, liquid, corrosive, n.o.s., 8, PGIII, (Isophoronediamine, 3,6,9,12-Tetraazatetradecane-1,14-diamine)

DOT Shipping Information:

United States (Domestic)and International:

Bulk Quantities (119 gallons (450 liters)or greater):
UN2735, Amines, liquid, corrosive, NOS, (Isophoronediamine, 3,6,9,12-Tetraazatetradecane-1,14-diamine), 8, PGIII (Marine Pollutant)

Drum Size Quantities (less that 119 gallons (450 liters)):
UN2735, Amines, liquid, corrosive, NOS, (Isophoronediamine, 3,6,9,12-Tetraazatetradecane-1,14-diamine), 8, PGIII (Marine Pollutant)

15 REGULATORY INFORMATION

Component (CAS) [%] - CODES

3,6,9,12-Tetraazatetradecane-1,14-diamine (4067-16-7) [36-50%] TSCA, DSL

4,4 -Isopropylidenediphenol (80-05-7) [1-5%] HAP, MASS, NJHS, PA, SARA313, TSCA, T AIR, DSL

Diethylene triamine (111-40-0) [10-30%] MASS, OSHAWAC, PA, TSCA, T AIR, DSL

Nonylphenol (25154-52-3) [1-5%] HAP, MASS, PA, TSCA, DSL

Isophoronediamine (2855-13-2) [36-50%] TSCA, DSL

Regulatory CODE Descriptions

TSCA = Toxic Substances Control Act
HAP = Hazardous Air Pollutants
MASS = MA Massachusetts Hazardous Substances List
NJHS = NJ Right-to-Know Hazardous Substances
PA = PA Right-To-Know List of Hazardous Substances
SARA313 = SARA 313 Title III Toxic Chemicals
TXAIR = TX Air Contaminants with Health Effects Screening Level
OSHAWAC = OSHA Workplace Air Contaminants
DSL = Canadian Domestic Substances List

16 OTHER INFORMATION

Disclaimer:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user s intended purposes or for the consequences of its use. Each individual

should make a determination as to the suitability of the information for their particular purpose(s).

MATERIAL SAFETY DATA SHEET

VIP PS TAPE

1. PRODUCT AND COMPANY NAME

PRODUCT NAME: VIP PS TAPE

DESCRIPTION: Pressure Sensitive Tape

MANUFACTURER: Richmond Aircraft Products
12801 Ann Street
Santa Fe Springs, CA 90670

FOR MORE INFORMATION CALL: 562-906-3300
IN CASE OF EMERGENCY CALL: 562-906-3300

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name	CAS #	% of Ingredient
Polyethlene terphalate	N/A	60%
Colorants	N/A	40%

3. HAZARD IDENTIFICATION

Tape products are exempted as articles from the notification requirements of the OSHA Hazard Communication standard under 29 CRF 1910.1200(b) (6) (iv). This Material Safety Data Sheet and the component information are made available as a service to our customers. None of the components are known to be hazardous.

POTENTIAL HEALTH HAZARDS

Route of Entry: N/A
Target Organs: N/A
Inhalation: None expected. However, if the tape is to be slit, it seems reasonable to treat the slitter dust as a nuisance particulate.
Skin Contact: Molten material will produce thermal burns.
Eye Contact: None expected
Ingestion: None expected

4. FIRST AID MEASURES

Inhalation: Not an expected route of entry.

Skin Contact: If burned by molten material, cool as quickly as possible with cold water and see a physician for treatment of the burn. Note to Physicians: burns should be treated as thermal burns. The product is a combination of polymers of low toxicity, therefore, there is no urgent need to remove them from the skin because of concern about toxicity.

Eye Contact: Not an expected route of entry.

Ingestion: Not an expected route of entry.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point (Method Used): 274C (525F)

LEL: N/A

UEL: N/A

Extinguishing Method: Water spray, dry chemicals, CO2

Special Fire Fighting Procedures: Wear NIOSH/MSHA approved positive pressure self-contained breathing apparatus and full protective clothing.

Unusual Fire and Explosion Hazards: Refer to NFPA Pamphlet No. 654 “Prevention of Fire and Dust Explosion in the Chemical, Dye, Pharmaceutical, and Plastics Industries”, if this material is to be reduced or collected as a powder. Incomplete burning can produce carbon monoxide and/or carbon dioxide and other harmful products.

6. ACCIDENTAL RELEASE MEASURES

Always wear recommended personal protective equipment. Collect and place in a solid waste container.

MATERIAL SAFETY DATA SHEET

7. HANDLING AND STORAGE

Handling Precautions: Use normal personal hygiene and good housekeeping

Storage Requirements: Store in a cool, dry area, away from direct heat or sunlight

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Engineering Controls: General ventilation is good industrial practice.
Protective Equipment: If the tape is to be slit, protection against nuisance dusts is recommended.
Exposure Guideline/Other: None

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Transparent blue coating on clear film
Physical Status:	Solid
Odor:	No odor
pH:	N/A
Vapor Pressure:	N/A
Vapor Density:	N/A
Boiling Point:	N/A
Softening Point:	400F (205C)
Solubility:	Negligible, <0.1%
Spec. Grav./Density:	1.32

10. STABILITY AND REACTIVITY

Stability:	Normally Stable
Conditions to avoid:	None identified
Materials to avoid (Incompatibility):	None identified
Hazardous Decomposition Products:	None identified. Incomplete burning can produce carbon monoxide and/or carbon dioxide and other harmful products.
Hazardous Polymerization:	Will not occur

11. TOXICOLOGICAL INFORMATION

Immediate (Acute) Effects:	Not determined
Delayed (Sub-chronic and chronic) Effects:	None known
Other Data:	No component of this product at levels greater than 0.1% is identified as a carcinogen by the ACGIH, IARC, NTP, or OSHA

12. ECOLOGICAL INFORMATION

These products have not been tested for environmental effects. However, because of their very low solubility, the following statements regarding the expected environmental impact are believed to be valid:

These products are expected to cause little oxygen depletion in aquatic systems. They are expected to have a low potential to affect aquatic organisms, secondary waste treatment micro-organisms, and the germination and growth of plants. They are expected to be resistant to biodegradation but are unlikely to bioconcentrate. Although in a spill situation these products may be esthetically unpleasant, they are not expected to have any adverse environmental impact.

13. DISPOSAL CONSIDERATIONS

Dispose of in compliance with Federal, state and local government regulations. Usually is considered an inert packaging material that can be recycled or landfilled.

14. TRANSPORT INFORMATION

US DOT Hazard Class: Not regulated
US DOT ID Number: Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

This product is not regulated as a hazardous substance

16. OTHER INFORMATION

Current Issue Date: 10/05/2010
Previous Issue Date: 04/25/2008

Safety Data Sheet

1 - Identification

Product Name: WD-40 Multi-Use Product Aerosol ***NOT FOR SALE IN CALIFORNIA*** **Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion** **Restrictions on Use: None identified** **SDS Date Of Preparation: 09/01/2014**	**Manufacturer: WD-40 Company** **Address: 1061 Cudahy Place (92110)** **P.O. Box 80607** **San Diego, California, USA** **92138 –0607** **Telephone:** **Emergency only: 1-888-324-7596 (PROSAR)** **Information: 1-888-324-7596** **Chemical Spills: 1-800-424-9300 (Chemtrec)** **1-703-527-3887 (International Calls)**

2 – Hazards Identification

Hazcom 2012/GHS Classification:
Flammable Aerosol Category 1
Gas Under Pressure: Compressed Gas
Aspiration Toxicity Category 1

Note: This product is a consumer product and is labeled in accordance with the US Consumer Product Safety Commission regulations which take precedence over OSHA Hazard Communication labeling. The actual container label will not include the label elements below. The labeling below applies to industrial/professional products.

Label Elements:

DANGER
Extremely Flammable Aerosol.
Contains gas under pressure; may explode if heated.
May be fatal if swallowed and enters airways.
Prevention
Keep away from heat, sparks, open flames, hot surfaces – No smoking.
Do not spray on an open flame or other ignition source.
Pressurized container: Do not pierce or burn, even after use.
Response
IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.
Storage
Store locked up.
Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F. Store in a well-ventilated place.
Disposal
Dispose of contents and container in accordance with local and national regulations.

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent	US Hazcom 2012/ GHS Classification
Aliphatic Hydrocarbon	64742-47-8	45-50	Flammable Liquid Category 3

			Aspiration Toxicity Category 1
Petroleum Base Oil	64742-56-9 64742-65-0 64742-53-6 64742-54-7 64742-71-8	35	Not Hazardous
LVP Aliphatic Hydrocarbon	64742-47-8	12-18	Aspiration Toxicity Category 1
Carbon Dioxide	124-38-9	2-3	Simple Asphyxiant Gas Under Pressure, Compressed Gas

Note: The exact percentages are a trade secret.

4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.
Eye Contact: Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.
Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.
Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.
Signs and Symptoms of Exposure: May cause eye and respiratory irritation. Inhalation may cause coughing, headache and dizziness. Skin contact may cause drying of the skin.
Indication of Immediate Medical Attention/Special Treatment Needed: Immediate medical attention is needed for ingestion.

5 – Fire Fighting Measures

Suitable (and unsuitable) Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.
Specific Hazards Arising from the Chemical: Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back. Combustion will produce oxides of carbon and hydrocarbons.
Special Protective Equipment and Precautions for Fire-Fighters: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.

6 – Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area.
Methods and Materials for Containment/Cleanup: Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Precautions for Safe Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.
Conditions for Safe Storage: Store in a cool, well-ventilated area, away from incompatible materials Do not store above 120°F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol. Store away from oxidizers.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure Limits
Aliphatic Hydrocarbon	1200 mg/m3 TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m3 TWA, 10 mg/m3 STEL ACGIH TLV 5 mg/m3 TWA OSHA PEL
LVP Aliphatic Hydrocarbon	1200 mg/m3 TWA (manufacturer recommended)
Carbon Dioxide	5000 ppm TWA (OSHA/ACGIH), 30,000 ppm STEL (ACGIH)

The Following Controls are Recommended for Normal Consumer Use of this Product
Appropriate Engineering Controls: Use in a well-ventilated area.
Personal Protection:
Eye Protection: Avoid eye contact. Always spray away from your face.
Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.
Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended
Appropriate Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.
Personal Protection:
Eye Protection: Safety goggles recommended where eye contact is possible.
Skin Protection: Wear chemical resistant gloves.
Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.
Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Appearance:	Light amber liquid	Flammable Limits: (Solvent Portion)	LEL: 0.6% UEL: 8%
Odor:	Mild petroleum odor	Vapor Pressure:	95-115 PSI 70°F
Odor Threshold:	Not established	Vapor Density:	Greater than 1 (air=1)
pH:	Not Applicable	Relative Density:	0.8 – 0.82 60°F
Melting/Freezing Point	Not established	Solubilities:	Insoluble in water
Boiling Point/Range:	361 - 369°F (183 - 187°C)	Partition Coefficient; n-octanol/water:	Not established
Flash Point:	122°F (49°C) Tag Closed Cup (concentrate)	Autoignition Temperature:	Not established
Evaporation Rate:	Not established	Decomposition Temperature:	Not established
Flammability (solid, gas)	Flammable Aerosol	Viscosity:	2.79-2.96 cSt 100°F
VOC:	412 grams/liter (49.5%)	Pour Point:	-63°C (-81.4°F) ASTM D-97

10 – Stability and Reactivity

Reactivity: Not reactive under normal conditions
Chemical Stability: Stable
Possibility of Hazardous Reactions: May react with strong oxidizers generating heat.
Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.
Incompatible Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

Symptoms of Overexposure:
Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.
Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.
Eye Contact: Contact may be irritating to eyes. May cause redness and tearing.
Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.
Chronic Effects: None expected.
Carcinogen Status: None of the components are listed as a carcinogen or suspect carcinogen by IARC, NTP, ACGIH or OSHA.
Reproductive Toxicity: None of the components is considered a reproductive hazard.

Numerical Measures of Toxicity:
The oral toxicity of this product is estimated to be greater than 5,000 mg/kg and the dermal toxicity greater than 2,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard.

12 – Ecological Information

Ecotoxicity: No specific aquatic toxicity data is currently available, however components of this product are not expected to be harmful to aquatic organisms
Persistence and Degradability: Component are readily biodegradable.
Bioaccumulative Potential: Bioaccumulation is not expected based on an assessment of the ingredients.
Mobility in Soil: No data available
Other Adverse Effects: None known

13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Do not puncture or incinerate containers, even empty. Dispose in accordance with federal, state, and local regulations.

14 – Transportation Information_

DOT Surface Shipping Description:
UN1950, Aerosols, 2.1 Ltd. Qty (Note: Shipping Papers are not required for Limited Quantities unless transported by air or vessel – each package must be marked with the Limited Quantity Mark)
IMDG Shipping Description: Un1950, Aerosols, 2.1, LTD QTY
ICAO Shipping Description: UN1950, Aerosols, flammable, 2.1 NOTE: WD-40 does not test aerosol cans to assure that they meet the pressure and other requirements for transport by air. We do not recommend that our aerosol products be transported by air.

15 – Regulatory Information

U.S. Federal Regulations:
CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.
SARA TITLE III:
Hazard Category For Section 311/312: Acute Health, Fire Hazard, Sudden Release of Pressure
Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III
Section 313 Reporting requirements: None
Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.
VOC Regulations: This product complies with the consumer product VOC limits of the US EPA and states adopting the OTC VOC rules but does not comply with CARB.
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): This product does not contain chemicals regulated under California Proposition 65.
Canadian Environmental Protection Act: One of the components is listed on the NDSL. All of the other ingredients are listed on the Canadian Domestic Substances List or exempt from notification.
Canadian WHMIS Classification: Class A (Compressed gas), Class B-5 (Flammable Aerosol)
This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS contains all of the information required by the CPR.

16 – Other Information:

HMIS Hazard Rating:
Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Reactivity – 0 (minimal hazard)

Revision Date: September 1, 2015 Supersedes: July 20, 2014

Prepared by: Industrial Health & Safety Consultants, Inc. Shelton, CT, USA

APPROVED By: I. Kowalski Regulatory Affairs Dept.

5049000/No.0015206

Safety Data Sheet
according to Regulation (EC) No. 1907/2006 (REACH)
according to Regulation (EU) No 453/2010

1. Identification of the substance/ preparation and of the company/ undertaking

1.1. **Product identifiers:**

Article no. (manufacturer / supplier): 405-V
Identification of the substance or preparation: Wemaplast 405-V
verschiedene RAL-Töne

1.2. **Relevant identified uses of the substance or mixture and uses advised against**

1.3. **Details of the supplier of the safety data sheet**

Supplier (manufacturer/importer/downstream user/distributor):
WEMA Coating Systems GmbH
Gwinnerstraße 46 Telephone: +49(0)69/4089869-0
D-60388 Frankfurt (Main) Telefax: +49(0)69/4089869-9

Dept. responsible for information:
E-mail (competent person):
info@wema-coating-systems.de

1.4. **Emergency telephone number**
Emergency telephone: +49(0)69/4089869-0
Only available during office hours.

2. Hazards identification

2.1. **Classification of the substance or mixture**

Classification according to Directive 67/548/EEC or 1999/45/EC

The preparation is dangerous in the sense of Directive 1999/45/EC.

R10	Flammable.
R67	Vapours may cause drowsiness and dizziness.

2.2. **Label elements**

Labelling (67/548/EEC or 1999/45/EC)

Hazard Statements:

10	Flammable.
67	Vapours may cause drowsiness and dizziness.

Safety precautions:

38	In case of insufficient ventilation, wear suitable respiratory equipment.
51	Use only in well-ventilated areas.
23	Do not breathe vapour.

contains:

n.a.

Special provisions concerning the labelling of certain mixtures

99	Contains Fettsäuren, C18-unges., Dimere, Reaktionsprodukte mit N, N_Dimethyl-1,3- propamediamin und 1,3- Propanediamin. May produce an allergic reaction.

2.3. **Other hazards**

3. Composition/ Information on ingredients

3.2. **Mixtures**

chemical characterization (preparation)

Description:

Hazardous ingredients:

Classification according to Directive 67/548/EEC or 1999/45/EC

EC No: CAS No.: INDEX no.:	REACH No: Identification of the hazard: classification:	% by weight Remark:
204-658-1 123-86-4 607-025-00-1	 n-butyl acetate R10 / R66 / R67	12,5 - 20
215-535-7 1330-20-7	 xylene, mixture of isomers	5 - 10

601-022-00-9	R10 / Xn; R20/21 / Xi; R38	
202-849-4 100-41-4 601-023-00-4	ethylbenzene F; R11 / Xn; R20	2,5 - 5
265-199-0 64742-95-6 649-356-00-4	Solvent naphtha (petroleum), light arom.; Low boiling point naphtha - unspecified Xn; R65	2,5 - 5
605-296-0 162627-17-0	Fettsäuren, C18-unges., Dimere, Reaktionsprodukte mit N, N_Dimethyl-1,3-propamediamin und 1,3- Propanediamin R43	< 0,5
265-199-0 64742-95-6 649-356-00-4	Solvent naphtha (petroleum), light arom.; Low boiling point naphtha - unspecified R10 / Xi; R37 / N; R51-53 / Xn; R65	< 0,5

Additional information
Full text of R-phrases: see section 16.

4. First-aid measures

4.1. **Description of first aid measures:**

General information:

In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness give nothing by mouth, place in unconscious position and seek medical advice.

After inhalation
Move victim to fresh air. Put victim at rest and keep warm. In case of irregular breathing or respiratory arrest provide artificial respiration.

In case of skin contact:
Take off immediately all contaminated clothing. After contact with skin, wash immediately with plenty of water and soap. Do not use solvents or thinners.

In case of eye contact:
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical advice.

After ingestion:
If swallowed, rinse mouth with water (only if the person is conscious). Consult physician immediately. Keep victim calm. Do not induce vomiting.

4.2. **Most important symptoms and effects, both acute and delayed:**

4.3. **Indication of any immediate medical attention and special treatment needed**

5. Firefighting measures

5.1. **Extinguishing media**

Suitable extinguishing media:
alcohol resistant foam, Carbon dioxide, Powder, spray mist, (water)

Extinguishing media which must not be used for safety reasons:
Strong water jet

5.2. **Special hazards arising from the substance or mixture**
Dense black smoke occurs during fire. Inhaling hazardous decomposing products can cause serious health damage.

5.3. **Advice for firefighters**
Provide a conveniently located respiratory protective device. Do not allow water used to extinguish fire to enter drains, ground or waterways. Treat runoff as hazardous. Cool closed containers that are near the source of the fire.

6. Accidental release measures

6.1. **Personal precautions, protective equipment and emergency procedures**
Keep away from sources of ignition. Ventilate affected area. Do not breathe vapours.

6.2. **Environmental measures**

Do not allow to enter into surface water or drains. If the product contaminates lakes, rivers or sewages, inform competent authorities in accordance with local regulations.

6.3. **Methods and material for containment and cleaning up**

Isolate leaked material using non-flammable absorption agent (e.g. sand, earth, vermiculit, diatomaceous earth) and collect it for disposal in appropriate containers in accordance with the local regulations (see chapter 13). Clean using cleansing agents. Do not use solvents.

6.4. **Reference to other sections**

Observe protective provisions (see chapter 7 and 8).

7. Handling and storage

7.1. **Precautions for safe handling**

Advices on safe handling

Avoid formation of flammable and explosive vapour concentrations in the air and exceeding the exposure limit values. Only use the material in places where open light, fire and other flammable sources can be kept away. Electrical equipment must be protected meeting the accepted standard. Product may become electrostatically charged. Provide earthing of containers, equipment, pumps and ventilation facilities. Anti-static clothing including shoes are recommended. Floors must be electrically conductive. Keep away from heat sources, sparks and open flames. Use only spark proof tools. Avoid contact with skin, eyes and clothes. Do not inhale dusts, particulates and spray mist when using this preparation. Avoid respiration of swarf. When using do not eat, drink or smoke. Personal protective equipment: refer to chapter 8. Do not empty containers with pressure - no pressure vessel! Always keep in containers that correspond to the material of the original container. Follow the legal protection and safety regulations.

Precautions against fire and explosion:

Vapours are heavier than air and will spread at floor level. Vapours form explosive mixtures with air.

7.2. **Conditions for safe storage, including any incompatibilities**

Requirements for storerooms and containers:

Storage in accordance with the Ordinance on Industrial Safety and Health (BetrSiVO). Keep container tightly closed. Do not empty containers with pressure - no pressure vessel! Smoking is forbidden. Access only for authorised persons. Store carefully closed containers upright to prevent any leaks.

Hints on joint storage

Keep away from strongly acidic and alkaline materials as well as oxidizers.

Further information on storage conditions

Take care of instructions on label. Store in a well-ventilated and dry room at temperatures between 15 °C and 30 °C. Protect from heat and direct sunlight. Keep container tightly closed. Remove all sources of ignition. Smoking is forbidden. Access only for authorised persons. Store carefully closed containers upright to prevent any leaks.

7.3. **Specific end use(s)**

Observe technical data sheet. Observe instructions for use.

8. Exposure controls / Personal protection

8.1. **Control parameters**

EC No: / CAS No.:	Description:		type:	Limit value STEL (EC)	Limit value TWA (EC)	unit
xylene, mixture of isomers		215-535-7		441	220	mg/m3
		1330-20-7	EN	100	50	ppm
ethylbenzene		202-849-4		552	441	mg/m3
		100-41-4	EN	125	100	ppm
n-butyl acetate		204-658-1		966	724	mg/m3
		123-86-4	EN	200	150	ppm

Additional information

TWA (EC): Occupational exposure limit value
STEL (EC): Short term occupational exposure limit value

8.2. **Exposure controls**

Provide good ventilation. This can be achieved with local or room suction. If this should not be sufficient to keep aerosol and solvent vapour concentration below the exposure limit values, a suitable respiratory protection must be used.

Occupational exposure controls:

Respiratory protection:

If concentration of solvents is beyond the occupational exposure limit values, approved and suitable respiratory protection must

be used. Use only respiratory protection equipment with CE-symbol including four digit test number.

Hand protection:
For prolonged or repeated handling the following glove material must be used:
Thickness of the glove material: > 0,4 mm ; penetration time (maximum wearing period): > 480 min.
Observe the instructions and details for use, storage, maintenance and replacement provided by the protective glove manufacturer. Penetration time of glove material depending on intensity and duration of exposure to skin. Recommended glove articles: DIN EN 374
Barrier creams can help protecting exposed skin areas. In no case should they be used after contact.

Eye protection:
Wear closely fitting protective glasses in case of splashes.

Body protection:
Wear antistatic clothing of natural fibers (cotton) or heat resistant synthetic fibers.

Protective measures:
After contact clean skin thoroughly with water and soap oder use appropriate cleanser.

Environmental exposure controls
Do not allow to enter into surface water or drains. refer to chapter 7. No further action is necessary.

9. Physical and chemical properties

9.1. **information on basic physical and chemical properties**

Appearance:	
Physical state:	liquid
Colour	refer to label
Odour:	characteristic

Safety relevant basis data		unit	Method	Remark:
Flash point:	28	°C	DIN 53213	
Ignition temperature (AIT):	370	°C		
lower explosion limit:	1,1	Vol-%		
Upper explosion limit:	7,5	Vol-%		
Vapour pressure at 20 °C:	5,05	mbar		
density at 20 °C:	1,37	g/cm³		
Water solubility (g/l):	insoluble			
pH at 20 °C:	-			
Viscosity at 20 °C	80 s 4 mm		DIN 53211	
Solvent separation test (%):	< 3	%		
Solid content (%):	72	% by weight		
solvent content:				
Organic solvents:	28	% by weight		
Water:	0	% by weight		

9.2. **Other information:**

10. Stability and reactivity

10.1. **Reactivity**

10.2. **Chemical stability**
Stable when applying the recommended regulations for storage and handling. Further information on correct storage: refer to chapter 7.

10.3. **Possibility of hazardous reactions**
Keep away from strong acids, strong bases and strong oxidizing agents to avoid exothermic reactions.

10.4. **Conditions to avoid**
Hazardous decomposition byproducts may form with exposure to high temperatures.

10.5. **Incompatible materials**

10.6. **Hazardous decomposition products**
Hazardous decomposition byproducts may form with exposure to high temperatures, e.g.: carbon dioxide, carbon monoxide, smoke, nitrogen oxides.

11. Toxicological information

No data on preparation itself available.

11.1. **Information on toxicological effects**

Acute toxicity

Toxicological data are not available.

Irritant and corrosive effects

Toxicological data are not available.

Sensitisation

Toxicological data are not available.

Specific target organ toxicity

Toxicological data are not available.

Aspiration hazard:

Toxicological data are not available.

Practical experience

Other observations:
Inhaling of solvent components above the MWC-value can lead to health damage, e.g. irritation of the mucous membrane and respiratory organs, as well as damage to the liver, kidneys and the central nerve system. Indications for this are: headache, dizziness, fatigue, amyosthenia, dizziness, in serious cases: unconsciousness. Solvents may cause some of the aforementioned effects through skin resorption. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and/or absorption through skin. Splashing may cause eye irritation and reversible damage.

Overall Assessment on CMR properties:

The components in this formulation do not meet the criteria for classification as CMR category 1 or 2.

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified according to the toxicological dangers.See chapters 2 and 15 for details.

12. Ecological information

Overall evaluation:
There is no information available on the preparation itself .
Do not allow to enter into surface water or drains.

12.1. **Toxicity**
Toxicological data are not available.

12.2. **Persistence and degradability**
Toxicological data are not available.

12.3. **Bioaccumulative potential**
Toxicological data are not available.

12.4. **Mobility in soil**
Toxicological data are not available.

12.5. **Results of PBT and vPvB assessment**

The components in this formulation do not meet the criteria for classification as PBT or vPvB.

12.6. **Other adverse effects**

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is not classified as dangerous for the environment.

13. Disposal considerations

13.1. **Waste treatment methods**

Appropriate disposal / Product
Recommendation:
Do not allow to enter into surface water or drains. This material and its container must be disposed of in a safe way. Waste disposal according to EC directives 75/442/EEC and 91/689/EEC in the corresponding versions, covering waste and dangerous waste.

Control report for waste code/ waste marking according to EAKV:

080111	waste paint and varnish containing organic solvents or other dangerous substances

Contaminated packaging:
Recommendation:
Cleaned containers may be recycled. Vessels not properly emptied are special waste.

14. Transport information

14.1. **UN-No.:**

Land transport (ADR/RID):	1263
Sea transport (IMDG):	n.a.

14.2. **UN proper shipping name**

Land transport (ADR/RID):	Paint
Sea transport (IMDG):	Transport in accordance with the provisions of paragraph 2.3.2.5 of the IMDG Code.
Air transport (ICAO-TI / IATA-DGR):	Paint

14.3. **Transport hazard class(es)**

Land transport (ADR/RID):	KEINE GÜTER DER KLASSE 3 bei Gebinden > 450 l Klasse 3
Sea transport (IMDG)	n.a.
Air transport (ICAO-TI / IATA-DGR)	3

14.4. **Packing Group:**

Land transport (ADR/RID):	III
Sea transport (IMDG):	n.a.
for packages > 30 litres:	III
Air transport (ICAO-TI / IATA-DGR):	III

14.5. **Environmental hazards:**

Land transport (ADR/RID)	n.a.
Marine pollutant:	n.a.

14.6. **Special precautions for user**

Transport always in closed, upright and safe containers. Make sure that persons transporting the product know what to do in case of an accident or leakage.
Advices on safe handling: see parts 6 - 8

Further remarks:

Land transport (ADR/RID)

Tunnel restriction code: D/E

Sea transport (IMDG)

EmS-No.: n.a.

14.7. **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

not applicable

15. Regulatory information

15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture**

EU legislation

Information according to 1999/13/EC about limitation of emissions of volatile organic compounds (VOC-guideline).

VOC-value (in g/l) ISO 11890-2:	648
VOC-value (in g/l) ASTM D 2369:	648

National regulations

Informations on working limitations:
Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC).

15.2. **Chemical Safety Assessment**
Chemical safety assessments for substances in this preparation were not carried out.

16. Other information

Wording of the r-phrases under paragraph 3:

R10		Flammable.
Xn; R20/21	Harmful	Harmful by inhalation and in contact with skin.
Xi; R38	Irritant	Irritating to skin.
F; R11	Highly flammable	Highly flammable
Xn; R20	Harmful	Harmful by inhalation.
R66		Repeated exposure may cause skin dryness or cracking.
R67		Vapours may cause drowsiness and dizziness.
Xn; R65	Harmful	Harmful: may cause lung damage if swallowed.
Xi; R37	Irritant	Irritating to respiratory system.
N; R51-53	Dangerous for the environment	Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.
R43		May cause sensitization by skin contact.

Further remarks:
The information supplied on this safety data sheet complies with our current level of knowledge as well as with national and EU regulations. Without written approval, the product must not be used for purposes different from those mentioned in chapter 1. It is always the user's duty to take any necessary measures for meeting the requirements laid down by local rules and regulations. The details in this safety data sheet describe the safety requirements of our product and are not to be regarded as guaranteed attributes of the product.

Safety Data Sheet
according to Regulation (EC) No. 1907/2006 (REACH)
according to Regulation (EU) No 453/2010

1. Identification of the substance/ preparation and of the company/ undertaking

1.1. **Product identifiers:**

Article no. (manufacturer / supplier): 800472298
Identification of the substance or preparation: Wemaplast Härter 405-VS

1.2. **Relevant identified uses of the substance or mixture and uses advised against**

1.3. **Details of the supplier of the safety data sheet**

Supplier (manufacturer/importer/downstream user/distributor):

WEMA Coating Systems GmbH
Gwinnerstraße 46
D-60388 Frankfurt (Main)
Telephone: +49(0)69/4089869-0
Telefax: +49(0)69/4089869-9

Dept. responsible for information:

E-mail (competent person):
info@wema-coating-systems.de

1.4. **Emergency telephone number**

Emergency telephone: +49(0)69/4089869-0
Only available during office hours.

2. Hazards identification

2.1. **Classification of the substance or mixture**

Classification according to Directive 67/548/EEC or 1999/45/EC

The preparation is dangerous in the sense of Directive 1999/45/EC.

R10		Flammable.
Xn; R20	Harmful	Harmful by inhalation.
R52-53		Harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

2.2. **Label elements**

Labelling (67/548/EEC or 1999/45/EC)

Xn Harmful

Hazard Statements:

10	Flammable.
20	Harmful by inhalation.
52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety precautions:

38	In case of insufficient ventilation, wear suitable respiratory equipment.
51	Use only in well-ventilated areas.
61	Avoid release to the environment. Refer to special instructions / safety data sheet.
23	Do not breathe vapour.

contains:

n.a.

Special provisions concerning the labelling of certain mixtures

91	Contains isocyanates. May produce an allergic reaction.
99	Contains 3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate. May produce an allergic reaction.

2.3. **Other hazards**

3. Composition/ Information on ingredients

3.2. **Mixtures**

chemical characterization (preparation)

Description: aliphatisches Polyisocyanat

Hazardous ingredients:

Classification according to Directive 67/548/EEC or 1999/45/EC

EC No:	REACH No:	

CAS No.: INDEX no.:	Identification of the hazard: classification:	% by weight Remark:
265-199-0 64742-95-6 649-356-00-4	Solvent naphtha (petroleum), light arom.; Low boiling point naphtha - unspecified Xn; R65	5 - 10
204-658-1 123-86-4 607-025-00-1	n-butyl acetate R10 / R66 / R67	5 - 10
202-436-9 95-63-6 601-043-00-3	1,2,4-trimethylbenzene R10 / Xn; R20 / Xi; R36/37/38 / N; R51-53	5 - 10
923-037-2	01-2119471991-29 Kohlenwasserstoffe C10-C12, Isoalkane, < 2% Aromaten R10 / R53 / Xn; R65 / R66	2,5 - 5
203-604-4 108-67-8 601-025-00-5	mesitylene R10 / Xi; R37 / N; R51-53	1 - 2,5
203-132-9 103-65-1 601-024-00-X	propylbenzene R10 / Xn; R65 / Xi; R37 / N; R51-53	0,5 - 1
202-704-5 98-82-8 601-024-00-X	cumene R10 / Xn; R65 / Xi; R37 / N; R51-53	0,5 - 1
223-861-6 4098-71-9 615-008-00-5	3-isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate T; R23 / Xi; R36/37/38 / R42/43 / N; R51-53	< 0,5
201-039-8 77-58-7	Dibutyl-Zinn-dilaurat C; R34 / Xi; R41 / R43 / T; R48/25 / N; R50-53 / Repr.Cat.2; R60-61 / Muta.Cat.3; R68	< 0,5

Additional information
Full text of R-phrases: see section 16.

4. First-aid measures

4.1. **Description of first aid measures:**

General information:

In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness give nothing by mouth, place in unconscious position and seek medical advice.

After inhalation
Move victim to fresh air. Put victim at rest and keep warm. In case of irregular breathing or respiratory arrest provide artificial respiration.

In case of skin contact:
Take off immediately all contaminated clothing. After contact with skin, wash immediately with plenty of water and soap. Do not use solvents or thinners.

In case of eye contact:
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Seek medical advice.

After ingestion:
If swallowed, rinse mouth with water (only if the person is conscious). Consult physician immediately. Keep victim calm. Do not induce vomiting.

4.2. **Most important symptoms and effects, both acute and delayed:**

4.3. **Indication of any immediate medical attention and special treatment needed**

5. Firefighting measures

5.1. **Extinguishing media**

Suitable extinguishing media:

alcohol resistant foam, Carbon dioxide, Powder, spray mist, (water)

Extinguishing media which must not be used for safety reasons:
Strong water jet

5.2. **Special hazards arising from the substance or mixture**
Dense black smoke occurs during fire. Inhaling hazardous decomposing products can cause serious health damage.

5.3. **Advice for firefighters**
Provide a conveniently located respiratory protective device. Do not allow water used to extinguish fire to enter drains, ground or waterways. Treat runoff as hazardous. Cool closed containers that are near the source of the fire.

6. Accidental release measures

6.1. **Personal precautions, protective equipment and emergency procedures**
Keep away from sources of ignition. Ventilate affected area. Do not breathe vapours.

6.2. **Environmental measures**
Do not allow to enter into surface water or drains. If the product contaminates lakes, rivers or sewages, inform competent authorities in accordance with local regulations.

6.3. **Methods and material for containment and cleaning up**
Isolate leaked material using non-flammable absorption agent (e.g. sand, earth, vermiculit, diatomaceous earth) and collect it for disposal in appropriate containers in accordance with the local regulations (see chapter 13). Clean using cleansing agents. Do not use solvents.

6.4. **Reference to other sections**
Observe protective provisions (see chapter 7 and 8).

7. Handling and storage

7.1. **Precautions for safe handling**

Advices on safe handling

Avoid formation of flammable and explosive vapour concentrations in the air and exceeding the exposure limit values. Only use the material in places where open light, fire and other flammable sources can be kept away. Electrical equipment must be protected meeting the accepted standard. Product may become electrostatically charged. Provide earthing of containers, equipment, pumps and ventilation facilities. Anti-static clothing including shoes are recommended. Floors must be electrically conductive. Keep away from heat sources, sparks and open flames. Use only spark proof tools. Avoid contact with skin, eyes and clothes. Do not inhale dusts, particulates and spray mist when using this preparation. Avoid respiration of swarf. When using do not eat, drink or smoke. Personal protective equipment: refer to chapter 8. Do not empty containers with pressure - no pressure vessel! Always keep in containers that correspond to the material of the original container. Follow the legal protection and safety regulations.

Precautions against fire and explosion:
Vapours are heavier than air and will spread at floor level. Vapours form explosive mixtures with air.

7.2. **Conditions for safe storage, including any incompatibilities**

Requirements for storerooms and containers:
Storage in accordance with the Ordinance on Industrial Safety and Health (BetrSiVO). Keep container tightly closed. Do not empty containers with pressure - no pressure vessel! Smoking is forbidden. Access only for authorised persons. Store carefully closed containers upright to prevent any leaks.

Hints on joint storage
Keep away from strongly acidic and alkaline materials as well as oxidizers.

Further information on storage conditions
Take care of instructions on label. Store in a well-ventilated and dry room at temperatures between 15 °C and 30 °C. Protect from heat and direct sunlight. Keep container tightly closed. Remove all sources of ignition. Smoking is forbidden. Access only for authorised persons. Store carefully closed containers upright to prevent any leaks.

7.3. **Specific end use(s)**
Observe technical data sheet. Observe instructions for use.

8. Exposure controls / Personal protection

8.1. **Control parameters**

EC No: CAS No.:	Description:	type:	Limit value STEL (EC) TWA (EC)	unit
mesitylene	203-604-4		100	mg/m3

	108-67-8	EG		20	ppm
cumene	202-704-5		375	125	mg/m3
	98-82-8	EN	50	25	ppm
n-butyl acetate	204-658-1		966	724	mg/m3
	123-86-4	EN	200	150	ppm
1,2,4-trimethylbenzene	202-436-9			100	mg/m3
	95-63-6	EG		20	ppm

Additional information
TWA (EC): Occupational exposure limit value
STEL (EC): Short term occupational exposure limit value

8.2. **Exposure controls**

Provide good ventilation. This can be achieved with local or room suction. If this should not be sufficient to keep aerosol and solvent vapour concentration below the exposure limit values, a suitable respiratory protection must be used.

Occupational exposure controls:

Respiratory protection:
If concentration of solvents is beyond the occupational exposure limit values, approved and suitable respiratory protection must be used. Use only respiratory protection equipment with CE-symbol including four digit test number.

Hand protection:
For prolonged or repeated handling the following glove material must be used:
Thickness of the glove material: > 0,4 mm ; penetration time (maximum wearing period): > 480 min.
Observe the instructions and details for use, storage, maintenance and replacement provided by the protective glove manufacturer. Penetration time of glove material depending on intensity and duration of exposure to skin. Recommended glove articles: DIN EN 374
Barrier creams can help protecting exposed skin areas. In no case should they be used after contact.

Eye protection:
Wear closely fitting protective glasses in case of splashes.

Body protection:
Wear antistatic clothing of natural fibers (cotton) or heat resistant synthetic fibers.

Protective measures:
After contact clean skin thoroughly with water and soap oder use appropriate cleanser.

Environmental exposure controls
Do not allow to enter into surface water or drains. refer to chapter 7. No further action is necessary.

9. Physical and chemical properties

9.1. **information on basic physical and chemical properties**

Appearance:
Physical state: liquid
Colour refer to label
Odour: characteristic

Safety relevant basis data		unit	Method	Remark:
Flash point:	42	°C	DIN 53213	
Ignition temperature (AIT):				
lower explosion limit:	0,8	Vol-%		
Upper explosion limit:	7,0	Vol-%		
Vapour pressure at 20 °C:		mbar		
density at 20 °C:	1,04	g/cm³		
Water solubility (g/l):	insoluble			
pH at 20 °C:	-			
Viscosity at 20 °C	40 s 4 mm		DIN 53211	
Solvent separation test (%):	< 3	%		
Solid content (%):	95	% by weight		
solvent content:				
Organic solvents:	5	% by weight		
Water:	0	% by weight		

9.2. **Other information:**

10. Stability and reactivity

10.1. **Reactivity**

10.2. **Chemical stability**
Stable when applying the recommended regulations for storage and handling. Further information on correct storage: refer to chapter 7.

10.3. **Possibility of hazardous reactions**
Keep away from strong acids, strong bases and strong oxidizing agents to avoid exothermic reactions.

10.4. **Conditions to avoid**
Hazardous decomposition byproducts may form with exposure to high temperatures.

10.5. **Incompatible materials**

10.6. **Hazardous decomposition products**
Hazardous decomposition byproducts may form with exposure to high temperatures, e.g.: carbon dioxide, carbon monoxide, smoke, nitrogen oxides.

11. Toxicological information

No data on preparation itself available.

11.1. **Information on toxicological effects**

Acute toxicity

Toxicological data are not available.

Irritant and corrosive effects

Toxicological data are not available.

Sensitisation

Toxicological data are not available.

Specific target organ toxicity

Toxicological data are not available.

Aspiration hazard:

Toxicological data are not available.

Practical experience

Other observations:
Inhaling of solvent components above the MWC-value can lead to health damage, e.g. irritation of the mucous membrane and respiratory organs, as well as damage to the liver, kidneys and the central nerve system. Indications for this are: headache, dizziness, fatigue, amyosthenia, dizziness, in serious cases: unconsciousness. Solvents may cause some of the aforementioned effects through skin resorption. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and/or absorption through skin. Splashing may cause eye irritation and reversible damage.

Overall Assessment on CMR properties:

EC No: CAS No.:	Identification of the hazard:	Classification according to Directive 67/548/EEC or 1999/45/EC
201-039-8 77-58-7	Dibutyl-Zinn-dilaurat	Repr. Cat. 2

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified according to the toxicological dangers.See chapters 2 and 15 for details.

12. Ecological information

Overall evaluation:
There is no information available on the preparation itself .
Do not allow to enter into surface water or drains.

12.1. **Toxicity**
Toxicological data are not available.

12.2. **Persistence and degradability**
Toxicological data are not available.

12.3. **Bioaccumulative potential**
Toxicological data are not available.

12.4. **Mobility in soil**
Toxicological data are not available.

12.5. **Results of PBT and vPvB assessment**

The components in this formulation do not meet the criteria for classification as PBT or vPvB.

12.6. **Other adverse effects**

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is classified for eco-toxicological properties accordingly. See Sections 2 and 15 for details.

13. Disposal considerations

13.1. **Waste treatment methods**

Appropriate disposal / Product
Recommendation:
Do not allow to enter into surface water or drains. This material and its container must be disposed of in a safe way. Waste disposal according to EC directives 75/442/EEC and 91/689/EEC in the corresponding versions, covering waste and dangerous waste.

Control report for waste code/ waste marking according to EAKV:
080111 waste paint and varnish containing organic solvents or other dangerous substances

Contaminated packaging:
Recommendation:
Cleaned containers may be recycled. Vessels not properly emptied are special waste.

14. Transport information

14.1. **UN-No.:**
1263

14.2. **UN proper shipping name**

Land transport (ADR/RID):	Paint related material
Sea transport (IMDG):	PAINT RELATED MATERIAL
Air transport (ICAO-TI / IATA-DGR):	Paint related material

14.3. **Transport hazard class(es)**
3

14.4. **Packing Group:**
III

14.5. **Environmental hazards:**

Land transport (ADR/RID)	n.a.
Marine pollutant:	n.a.

14.6. **Special precautions for user**

Transport always in closed, upright and safe containers. Make sure that persons transporting the product know what to do in case of an accident or leakage.
Advices on safe handling: see parts 6 - 8

Further remarks:

Land transport (ADR/RID)

Tunnel restriction code:	D/E

Sea transport (IMDG)

EmS-No.:	F-E, S-E

14.7. **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
not applicable

15. Regulatory information

15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture**

EU legislation

Information according to 1999/13/EC about limitation of emissions of volatile organic compounds (VOC-guideline).

VOC-value (in g/l) ISO 11890-2: 52
VOC-value (in g/l) ASTM D 2369: 52

National regulations

Informations on working limitations:
Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC).

15.2. **Chemical Safety Assessment**
A chemical safety assessment has been carried out on following substance:

EC No: CAS No.:	chemical name:	REACH No:
923-037-2	Kohlenwasserstoffe C10-C12, Isoalkane, < 2% Aromaten	01-2119471991-29

16. Other information

Wording of the r-phrases under paragraph 3:

R10		Flammable.
Xn; R65	Harmful	Harmful: may cause lung damage if swallowed.
Xi; R37	Irritant	Irritating to respiratory system.
N; R51-53	Dangerous for the environment	Toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.
T; R23	Toxic	Toxic by inhalation.
Xi; R36/37/38	Irritant	Irritating to eyes, respiratory system and skin.
R42/43		May cause sensitization by inhalation and skin contact.
R66		Repeated exposure may cause skin dryness or cracking.
R67		Vapours may cause drowsiness and dizziness.
Xn; R20	Harmful	Harmful by inhalation.
C; R34	Corrosive	Causes burns.
Xi; R41	Irritant	Risk of serious damage to eyes.
R43		May cause sensitization by skin contact.
T; R48/25	Toxic	Toxic: danger of serious damage to health by prolonged exposure if swallowed.
N; R50-53	Dangerous for the environment	Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.
Repr.Cat.2; R60-61	Reproductive toxic Cat.2 (Repr. Cat. 2)	May impair fertility. May damage the unborn child.
Muta.Cat.3; R68	Mutagenic Cat. 3 (Mut. Cat. 3)	Possible risk of irreversible effects.
R53		May cause long-term adverse effects in the aquatic environment.

Further remarks:
The information supplied on this safety data sheet complies with our current level of knowledge as well as with national and EU regulations. Without written approval, the product must not be used for purposes different from those mentioned in chapter 1. It is always the user's duty to take any necessary measures for meeting the requirements laid down by local rules and regulations. The details in this safety data sheet describe the safety requirements of our product and are not to be regarded as guaranteed attributes of the product.

Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Superla White Oil 21, 35

Product Use: White oil
Product Number(s): 231004, 231006
Company Identification
Chevron Products Company
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevron.com
Product Information: 1 (800) 582-3835, LUBETEK@chevron.com

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Not classified as hazardous according to 29 CFR 1910.1200 (2012).

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
White mineral oil	8042-47-5	100 %weight

This material complies with Food And Drug Administration Regulation 178.3570 code of Federal Regulations, Title 21.

SECTION 4 FIRST AID MEASURES

Description of first aid measures
Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Most important symptoms and effects, both acute and delayed
IMMEDIATE SYMPTOMS AND HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

DELAYED OR OTHER SYMPTOMS AND HEALTH EFFECTS: Not classified.

Indication of any immediate medical attention and special treatment needed
Not applicable.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge. Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
White mineral oil	ACGIH	5 mg/m3	10 mg/m3	--	--
White mineral oil	OSHA Z-1	5 mg/m3	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless
Physical State: Liquid
Odor: Petroleum odor
Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: <0.01 mmHg @ 37.8 °C (100 °F)
Vapor Density (Air = 1): >1
Initial Boiling Point: 315°C (599°F)
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: Not Applicable
Melting Point: Not Applicable
Specific Gravity: 0.85 @ 15.6°C (60.1°F) / 15.6°C (60.1°F) Minimum
Viscosity: 39.3 mm2/s @ 40°C (104°F) Minimum
Decomposition temperature: No Data Available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): No Data Available
Flashpoint: (Cleveland Open Cup) 204 °C (399 °F) (Typical)
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: This material is not expected to react.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for similar materials.

Skin Corrosion/Irritation: The skin irritation hazard is based on evaluation of data for similar materials.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials.

Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.
Carcinogenicity: The hazard evaluation is based on data for components or a similar material.
Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is not expected to be harmful to aquatic organisms. The ecotoxicity hazard is based on an evaluation of data for the components or a similar material. The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY

No data available.

PERSISTENCE AND DEGRADABILITY

This material is considered inherently biodegradable. This material is not expected to present any environmental problems other than those associated with oil spills. See Section 6 for Accidental Release Measures.The product has not been tested. The statement has been derived from products of a similar structure and composition.

POTENTIAL TO BIOACCUMULATE

Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PETROLEUM LUBRICATING OIL, NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR

IMO/IMDG Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER THE IMDG CODE

ICAO/IATA Shipping Description: PETROLEUM LUBRICATING OIL; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO TI OR IATA DGR

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:
Not applicable

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

White mineral oil 01-1, 02, 05, 06, 07

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

NEW JERSEY RTK CLASSIFICATION:

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: PETROLEUM OIL

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 0 Flammability: 1 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

LABEL RECOMMENDATION:

Label Category : BASE OIL 1 - BAS1

REVISION STATEMENT: This revision updates the following sections of this Safety Data Sheet: 1-16

Revision Date: MAY 01, 2014

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
HMIS - Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)

DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to the 29 CFR 1910.1200 (2012) by Chevron Energy Technology Company, 6001 Bollinger Canyon Road San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

E Water Quality and Wetlands

Ball Hill FEIS
Water Quality and Wetlands

November 2016

Prepared for:

Ball Hill Wind Energy, LLC
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Prepared by:

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List of Abbreviations and Acronyms

ATV	all-terrain vehicles
Ball Hill	Ball Hill Wind Energy, LLC
BMP	best management practices
CFR	Code of Federal Regulations
FEIS	Final Environmental Impact Statement
ISMP	Invasive Species Management Plan
JD	Jurisdictional Determination
NOI	Notice of Intent
NYSDEC	New York State Department of Environmental Conservation
O&M	operations and maintenance
PJD	Preliminary Jurisdictional Determination
Project	Ball Hill Wind Project
ROW	right of way
SDEIS	Supplemental Draft Environmental Impact Statement
SEQRA	New York State Environmental Quality Review Act
SPDES	State Pollutant Discharge Elimination System
SPCC	spill prevention and control
SWPPP	Storm Water Pollution Prevention Plan
USACE	United States Army Corps of Engineers

E.1 Water Quality

This appendix provides a description of stream delineations and a detailed discussion of the overall stream impacts and proposed water quality mitigation activities for any impacts from construction and operation of the Ball Hill Wind Project (Project). This appendix also addresses possible impacts on groundwater and surface water resulting from construction and operation of the Project. Construction activities, including building access roads, installing turbines, and placing electrical collection and transmission lines, may impact the condition of groundwater and surface water resources and, ultimately, water quality. Ball Hill will minimize any potential construction impacts on surface or groundwater quality through the implementation of best management practices (BMPs) as described herein.

Long-term impacts on surface water quality are expected to be minimal because Project components were sited to avoid impacts on groundwater and surface water resources by locating them in previously disturbed areas to the extent practicable.

Existing Conditions

Stream delineation surveys were conducted in 2015 and 2016 to evaluate impacts and proposed mitigation and to support federal and state permits. The Project Wetland Delineation Report and a request for jurisdictional determination were submitted to the United States Army Corps of Engineers (USACE) and the New York State Department of Environmental Conservation (NYSDEC) on July 21, 2016. The USACE and NYSDEC conducted site visits to verify wetland boundaries on August 24, 2016, and September 14, 2016, respectively.

The preliminary impact analysis provided in the Supplemental Draft Environmental Impact Statement (SDEIS) was prepared utilizing data from surveys conducted in 2011, 2012, and 2015. Since that time, the updated stream and wetland information was used to support micro-siting of the Project to avoid and minimize impacts on streams wherever practicable. The general stream types and conditions on the Project Site remain the same as those described in the SDEIS. More detailed information regarding the data used for this stream evaluation is included in Section E.3 of this appendix, the Wetland Delineation Report.

Table E-1 contains the updated existing conditions and stream characteristics for the Project. A total of 109 streams were delineated in the Project Area.

E.1.1 Construction Impacts

Since publication of the SDEIS, Ball Hill Wind Energy, LLC (Ball Hill) has engaged in a process of micrositing and analyzing engineering options and controls in order to minimize or avoid the Project's environmental impacts identified in the SDEIS. Beginning with the layout presented in the SDEIS, the Project was microsited to decrease temporary and permanent impacts to water resources.

Construction impacts for water resources are calculated for all areas where disturbance from construction of the Project may occur and includes both temporary impacts and permanent impacts.

Groundwater

As described in the SDEIS, construction of the Project is not expected to cause any significant adverse impact on groundwater. It is possible that shallow groundwater may be encountered during excavation of Project facilities or that other localized groundwater flow disruptions may take place downgradient of the turbine foundations, access roads, collection lines, substation, and transmission pole foundations. However, should this occur, it is anticipated that preconstruction groundwater conditions would restore themselves as groundwater fills in behind the subsurface Project facilities.

Any soil compaction that takes place during construction is not expected to extend to the water table; therefore, groundwater movement would not be disrupted by compaction. Compaction could potentially result in less groundwater infiltration in affected areas. However, the total area where compaction could potentially take place (85.5 acres [see Table A-1]), in comparison with the amount of pervious surface that readily allows infiltration to groundwater in the Project Area, is minor and is not expected to cause any changes in regional groundwater levels or quality. Soil compaction is expected to be temporary and limited to the construction period.

Construction of the Project may increase the potential for introduction of pollutants into groundwater as a result of possible spills of petroleum or other chemicals. To avoid or mitigate any such potential impact, Ball Hill will develop and implement a construction spill prevention and control (SPCC) plan prior to construction. In addition, prior to operation of the Project, Ball Hill will develop an operational SPCC plan, pursuant to 40 Code of Federal Regulations (CFR) Part 112, because oil on site would be greater than 1,320 gallons. Sources of oil could include the main power transformer, gear oils, and hydraulic fluids located in the turbines, and any oil or fuel storage as part of construction. Ball Hill general policies for the implementation of the SPCC are included in the Environmental Monitoring Plan in Appendix S. As construction of the Project develops, a site-specific SPCC will be established and included as an appendix to Ball Hill's construction plans.

Construction of the Project is not expected to impact private or public drinking sources. Typically, drinking water wells, such as those used by residents in the

Project Area, are designed to withdraw water from deep aquifers, which would utilize a deeper source of groundwater that would not be encountered during construction. If areas of shallow groundwater exist in the vicinity of Project facilities, they would be identified during site-specific, detailed foundation engineering investigations performed in conjunction with the road and foundation design processes and addressed in the design plans.

Blasting may be necessary if areas with shallow bedrock are encountered during construction. First, mechanical methods would be attempted to remove the bedrock, including ripping or conventional excavation. If blasting is necessary, it would be performed in a manner designed to control energy release. In general, blasting activities can cause adverse effects to groundwater flow due to ground dislocation from the force of the blast. Alteration of groundwater flow can potentially reduce or eliminate the amount of groundwater supplied to nearby wells. Temporary increases in turbidity and changes in water level may occur in wells located in proximity to the Project facilities during construction activities involving blasting. Potential blasting activities are not anticipated to impact private or public drinking sources due to the typical depth of drinking water wells in the Project Area. Additionally, Ball Hill would limit blasting operations to the minimum quantity and force required to fracture and loosen the rock to the necessary depth. Site-specific blasting plans will take into consideration potential effects on nearby water supply wells, as applicable.

Surface Water

A total of 48 stream crossings are necessary for construction and operation of the Project. These streams would be crossed by access roads, collection lines, and the transmission line. Locations of streams surveyed within the survey corridor are described in the Wetland Delineation Report (see Section E.3 of this Appendix). The potential sources of impacts on these streams are summarized on Table E-1 and shown on Figure E-1. Measures were taken during the Project's siting process to avoid stream crossings to the extent practicable. Due to the location and number of streams in the Project Area and the linear nature of Project facilities, it would be necessary to cross streams to install access roads, collection lines, and/or transmission lines. Because specific crossings are regulated by the USACE and NYSDEC, Ball Hill will refine its stream crossing methods, as appropriate, with these agencies as part of the required permitting process. Final crossing designs will be provided to the Towns upon permit issuance.

Within the generation portions of the Project, reduced construction rights of way (ROWs) for temporary access roads located within sensitive resources may be installed to avoid or minimize impacts. Culverts of an appropriate type and size to maintain sufficient flow would be used where access roads cross streams. Collection lines would be installed within a maximum 80-foot-wide ROW where multiple circuits are running parallel. Underground collection lines would be installed via trenching of the streams; however, impacts would be minimal since trenching would take place under dry conditions. Streams that are not naturally dry at the time of crossing would be temporarily dammed, with the water pumped

around the construction area to allow collection lines to be installed in dry conditions. The equipment that would be used to install the collection lines would cut a trench, place the cable, and backfill the trench in a single pass, which would reduce the duration of stream disturbance.

For the transmission portion of the Project, stream crossings would be avoided during construction to the maximum extent practicable. Construction of the transmission line requires the clearing of woody vegetation from an 80-foot-wide cleared ROW to allow installation of the transmission poles and lines and avoid interference with vegetation once the lines are installed. All transmission lines will have overhead crossings of streams within the transmission line ROW. Due to the location and number of streams along the transmission line, it would be necessary to cross streams during construction. Stream crossings would be limited to a 12-foot temporary construction corridor. Temporary construction impacts would be minimized by using temporary crossings or wetland mats for equipment crossings; however, some minor impacts may occur within the 12-foot travel corridor. Any vegetation impeding equipment access would be hand-cleared in the vicinity of streams. Clearing vegetation along crossed streams may disturb streams, in addition to slight water temperature changes due to loss of shade; however, where practicable, stumps would be left in place to minimize erosion and sedimentation and to facilitate natural revegetation once construction is complete. Upon completion of construction of the overhead electrical transmission lines, operations and maintenance (O&M) vehicles would be via all-terrain vehicles (ATVs) or comparable vehicles.

Protected Streams

Seventeen of the streams crossed by the Project have been classified as protected streams by NYSDEC. These stream segments, all of which are Class A streams, would be crossed by access roads and collection lines. Class A streams are identified as potential drinking water sources. The impacted streams are tributaries of Silver Creek, which flows into the Silver Creek Reservoir, located to the northeast of the Project Area. Any crossings that are necessary for Project construction would be designed to minimize degradation of the streams. Culverts of an appropriate type and size to maintain sufficient flow would be installed at stream crossings. After construction is complete, temporary access roads associated with the turbines and laydown areas would be reduced to 18-foot permanent access roads.

Stormwater

Construction of the Project could impact the quality of stormwater runoff. Indirect impacts on surface waters that could potentially result from construction activities include increases in sedimentation and turbidity caused by increased surface runoff from disturbed areas and the possible release of pollutants or hazardous materials in the event of a spill during construction. These impacts are expected to be minor, short-term, and reversible, with the exception of a minor permanent increase in impervious surface area, which will be mitigated through compliance with the site-specific Storm Water Pollution Prevention Plan

(SWPPP). See Section E.1.4 for a full discussion of mitigation of potential impacts on stormwater from construction.

E.1.2 Operational Impacts

The Project was microsited from the SDEIS layout to decrease temporary and permanent impacts to water resources. Operational impacts for water resources are calculated for all areas where disturbance from construction of the Project may occur and includes permanent impacts.

Groundwater

The operation of the Project is not expected to have any permanent impacts on groundwater within the Project Site. The Project would add only 33.36 acres of impervious surface within the 9,715-acre Project Area, including the following approximate areas: O&M Site (3.86 acres); Substation Site (0.18 acres [0.89 acres of open graded stone are not included as impervious]); Switchyard Site (0.66 acres [3.29 acres of open graded stone not included as impervious]); tower pedestals (0.15 acres); crane pads (2.66 acres); and permanent access roads (25.85 acres). The effect on groundwater recharge would, therefore, be negligible. The potential for pollutants to enter the groundwater from spills of petroleum and other chemicals during operation of the Project would be minimized through the continued implementation of BMPs and spill prevention measures set forth in the SPCC which will be finalized prior to construction. Implementation of these measures is expected to result in the avoidance of impacts on groundwater and residential drinking water wells within or outside the Project Site.

Surface Water

No significant adverse impacts on streams in the Project Area are expected from operation of the Project. A total of 16 streams would be crossed by permanent access roads. Upon completion of construction, temporary access roads would be reduced to 18-foot permanent access roads for turbines. Permanent culverts would be installed in access roads at stream crossings and maintained as necessary. No permanent fill would be placed in the stream channel; however, alteration of the vegetative communities on the banks may have minor impacts on stream ecology or function due to loss of shade. While impacts on riparian vegetation to maintain the collection ROW may be necessary during operation, stream banks would remain vegetated in an herbaceous or scrub-shrub state.

Protected Streams

Operation of the Project is not expected to result in any significant adverse impacts on protected streams. Permanent culverts would be inspected, maintained, and repaired as necessary to ensure no blockage, washouts, or other adverse impacts result. The presence of the transmission line and underground electrical collection lines would have no impact on stream ecology or function; impacts on riparian vegetation to maintain the collection ROW may be necessary during operation; however, stream banks would remain vegetated in an herbaceous or scrub-shrub state.

Stormwater

No significant increase in impervious surface would result from the operation of the Project. A total of 33.36 acres of impervious surface would be added to the 9,715-acre Project Area, as detailed above. These Project facilities will be designed for proper surface water flow and stormwater management, in compliance with the site-specific SWPPP. Therefore, no significant adverse impacts on stormwater runoff volumes or water quality are anticipated.

E.1.3 Summary of Impacts

Based on the layout of Project components, a total of 31 perennial streams, six intermittent, and six ephemeral streams would be crossed by Project facilities (see Table E-1 and Figure E-1). Seventeen NYSDEC-protected streams would be crossed by the Project facilities. These streams are discussed under the Protected Streams heading within this section. A total of 27 perennial streams and four intermittent streams would be crossed by the generation components of the Project. Nineteen streams are crossed by access roads associated with the generation portion of the Project and 12 are crossed by collection lines (see Table E-1 and Figure E-1). In the transmission portion of the Project, a total of four perennial streams, two intermittent streams, and six ephemeral streams would be crossed (see Table E-1).

As described above, construction of the Project may result in minor, short-term impacts on the streams crossed. These impacts could occur as a result of in-stream construction activities or construction on slopes adjacent to stream channels. If permanent culverts are necessary, culverts would be designed and installed in a manner maintaining natural stream flow and water velocity. Clearing and grading stream banks, culvert installation, in-stream trenching, trench dewatering, and backfilling could result in modification of aquatic habitat, increased water temperature, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants contained in stream sediments, and introduction of chemical contaminants, such as fuel and lubricants from possible spills. In general, these impacts would be temporary, short-term, and reversible as they are limited only to the period of in-stream construction.

Construction of the Project could result in indirect impacts on the quality of stormwater runoff as a result of increased surface runoff from disturbed areas and the possible release of pollutants or hazardous materials in the event of a spill during construction. These impacts are expected to be minor, short-term, and reversible, with the exception of a minor permanent increase in impervious surface area, which will be mitigated through compliance with the site-specific SWPPP.

No additional impacts are anticipated as a result of the Project.

E.1.4 Mitigation

Several measures will be implemented to ensure surface water quality protection, including implementation of BMPs as set forth in the site-specific SWPPP to be developed for this Project and a Notice of Intent will be filed prior to construc-

tion. Environmental monitoring of the site will occur throughout construction and site restoration will be performed in accordance with Ball Hill's construction plan and the SWPPP.

The SWPPP will encompass all requirements set forth by the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities and will include an erosion and sediment control plan and measures for post-construction runoff control as required. Furthermore, during construction, sediment and erosion control devices will be monitored weekly, at a minimum, and twice weekly if more than 5 acres are disturbed at one time, as per SPDES regulations and the NYSDEC Standards and Specification for Sediment and Erosion Control. The SWPPP will be submitted to the Towns and NYSDEC prior to construction, as required.

The SWPPP will require using sediment and erosion control measures and other BMPs during construction. Typical stormwater pollution prevention measures will be implemented as set forth in the SWPPP. Some examples include utilizing straw bale dikes, perimeter dikes/swales, silt fencing, stabilizing the construction entrance, stone/rock outlet sediment traps, stone check dams, level spreading, pipe slope drains, and dust control. Site-specific BMPs will be implemented prior to construction and will be described in more detail in the SWPPP, when developed. Furthermore, maintenance and BMPs will be used for post-construction runoff control, as required. This will ensure that temporarily impacted features do not create more stormwater runoff than preconstruction conditions.

In addition, a construction-specific SPCC will be prepared that contains measures to prevent spills and, in the event of a spill, provides response procedures that will be used to avoid and/or minimize potential adverse groundwater and surface water impacts. Any spillage of fuels, waste oils, other petroleum products, or hazardous materials in proximity to waterbodies shall be reported to NYSDEC's Spill Hotline (1-800-457-7362) within two hours.

Groundwater

Potential significant adverse groundwater impacts will be avoided and/or minimized through SWPPP implementation of the mitigation measures and BMPs set forth in the SWPPP. All surface soils that are temporarily compacted will be decompacted and/or mitigated. Subsoil within approximately 35 feet of the turbine base will remain compacted, as this provides additional structural stability over the foundation. However, the topsoil will be placed over the compacted soil within this approximately 35-foot radius. Instances of soil compaction outside the 35-foot radius will be minimized through the SWPPPs and BMPs, including the segregation of subsoil and topsoil, use of geotextiles to prevent compaction, and soil compaction mitigation where appropriate. Similar activities in wetlands, if encountered, will be governed by NYSDEC and USACE permits.

If shallow groundwater enters the excavation areas during turbine foundation placement, it may be pumped out during installation of the foundation. Any

groundwater that is pumped out of a foundation excavation will be discharged to an area that will either direct the flow toward existing waterbodies or temporarily retain the water until it can filter back into the ground. Specific details relating to pumping groundwater will be included in the SWPPP. Temporary sediment traps or the controlled release of water over vegetated areas will be utilized during construction to intercept and manage sediment-laden runoff from dewatering of turbine foundations. Based on engineering designs, the control practices will retain the runoff and allow sediment to settle prior to discharge. For dewatering practices, the sediment traps shall be placed adjacent to the turbine foundations, with the outlet discharging to a swale, a ditch, or vegetated area.

Surface Water

Potential significant adverse surface water impacts will be avoided and/or minimized by siting Project components away from surface water resources to the extent practicable. However, it will be necessary to cross streams to install access roads and collection lines. During construction, appropriate erosion/sediment control measures (e.g., silt fences or straw bale dikes or other stormwater control measures) will be used to limit the area of impact on surface waters in accordance with USACE and NYSDEC permit requirements. Any sediment runoff or increased turbidity in surface waters resulting from construction will be minimal. Any construction activities occurring within 50 feet of protected stream banks will be conducted in accordance with NYSDEC permit requirements. Other measures that will be implemented to minimize impacts on streams during construction include the following:

- Clearing of existing vegetation will be limited to the material that poses a hazard or hindrance to construction. Snags that provide shelter in streams for fish will not be disturbed unless they cause serious obstructions, scouring, or erosion. Trees will not be felled into any stream or onto the immediate stream bank.
- Where necessary, appropriately sized culverts will be installed to meet hydraulic capacity and structural integrity criteria.
- There will be no widening or constriction of the stream channel bed through the road crossing, and no berms will be constructed on the stream banks.
- If culverts with bottoms are to be used and will be permanent, including round culverts, they will be installed so that at least 20% of the culvert's height is embedded below the existing stream bed at the outlet end of the culvert. The streambed material that is excavated to accommodate culvert placement will then be spread evenly on the bottom of the new culvert. If it is not practical to spread streambed material throughout the entire bottom of the new culvert, material will be spread in the culvert at the inlet and outlet ends gradually up to streambed elevation to promote natural deposition. Culverts with bottoms, including round culverts, will not be used if the streambed is bedrock.
- Access road shoulders will be adequately protected with riprap or seeded and mulched within seven days of completion of the temporary and permanent

culvert crossing. Mitigation of stream disturbances within 50 feet of protected streams will be coordinated with the applicable agencies (i.e., NYSDEC and USACE).

- During periods of work activity, flow immediately downstream of the work site will approximate flow immediately upstream of the work site.
- Where streams with flow at the time of construction will be crossed, dam-and-pump procedures will be followed to control water adjacent to the work area.
- Any additional recommendations identified by NYSDEC or USACE during the permitting process.

Access roads and collection lines were co-located with existing stream crossings whenever possible to avoid creating new disturbances of these resources. Project facilities were co-located with existing disturbed areas where possible (including existing farming and logging roads and ATV trails), in an effort to minimize impacts and improve these areas.

Underground collection lines and overhead transmission lines will be installed across streams. To minimize impacts, timber mats may be used during construction to bridge streams to minimize impacts associated with equipment crossing. Any in-stream disturbance, such as trenching, will take place during dry conditions to minimize downstream impacts. If water is present at the time of crossing, Ball Hill will dewater the area using a dam-and-pump crossing to minimize stream impacts. To further minimize impacts on streams, the trench will be opened, installation accomplished, and backfilled in one continuous operation, thus limiting the duration of in-stream work. As currently designed, the collection lines are entirely underground. Woody vegetation along the stream bank will be cut in some places, but to the maximum extent practicable, stumps will be left in place to protect against erosion. Stream crossings will be engineered, designed, and installed to maintain sufficient flow during construction in accordance with applicable regulations. These methods will be provided to the Towns upon submittal of the Joint Application for Permit to NYSDEC and the USACE. Sheet DT-1 of Appendix C of this FEIS, Project Drawings provides proposed culvert sizing.

Table E-1 Total Stream Impacts, Entire Project

	Count of Total Streams Impacted[1]	Count of Perennial Streams Impacted	Count of Intermittent Streams Impacted	Count of Ephemeral Streams Impacted	Count of NYSDEC-Protected Streams Impacted	Length of Stream within the Construction ROW[2] (LFT)	Length of Stream within the Permanent Disturbance Corridor[3] (LFT)	Temporary Impacts (Areas to be Restored to Preconstruction Contours following Construction) (LFT)
Total SDEIS[6]	**49**	**43**	**6**	**0**	**21**	**5,391.85**	**772.39**	**5,391.85**
Generation Portion of the Project (FEIS)[1]	31	28	4	0	17	2,416.1	777.31	1,638.79
Transmission Portion of the Project (FEIS)[4]	12	4	2	6	0	1,509.0	0	1,509.0
Total FEIS[5]	**43**	**31**	**6**	**6**	**17**	**3,925.1**	**777.31**	**3,147.79**
Change from SDEIS to FEIS	**-6**	**- 12**	**0**	**+6**	**-4**	**-1,466.75**	**+4.92**	**-2,244.06**

Notes:

1 The generation portion of the Project includes turbines, access roads, electrical collection lines, laydown areas, and the O&M building site.

2 Construction disturbance includes all areas to be disturbed during construction activities. As such, they include all impact related to clearing and grading of stream banks, in-stream trenching, trench dewatering, and backfilling. For the generation portion of the Project, this includes the linear feet of all streams that fall within the construction limit of disturbance. For the transmission portion of the Project, this includes the linear feet of all streams that fall within the 80-foot-wide cleared ROW.

3 Stream impacts within the permanent disturbance corridor refer to in-stream trenching, trench dewatering, and backfilling and culvert installation. Upon completion of construction, temporary access roads will be reduced to 18-foot permanent access roads for turbines and laydown areas. Permanent culverts will be installed in access roads at stream crossings and maintained as necessary. No permanent fill would be placed in the stream channel; however, alteration of the vegetative communities on the banks may have minor impacts on stream ecology or function due to loss of shade.

4 The transmission portion of the Project includes the collection substation, 5.7-mile transmission ROW, and the interconnection substation.

5 Due to rounding, totals may not reflect the sum of numbers.

6 In the SDEIS, impacts reported were based on delineations completed in 2008, 2012, 2013, and 2015.

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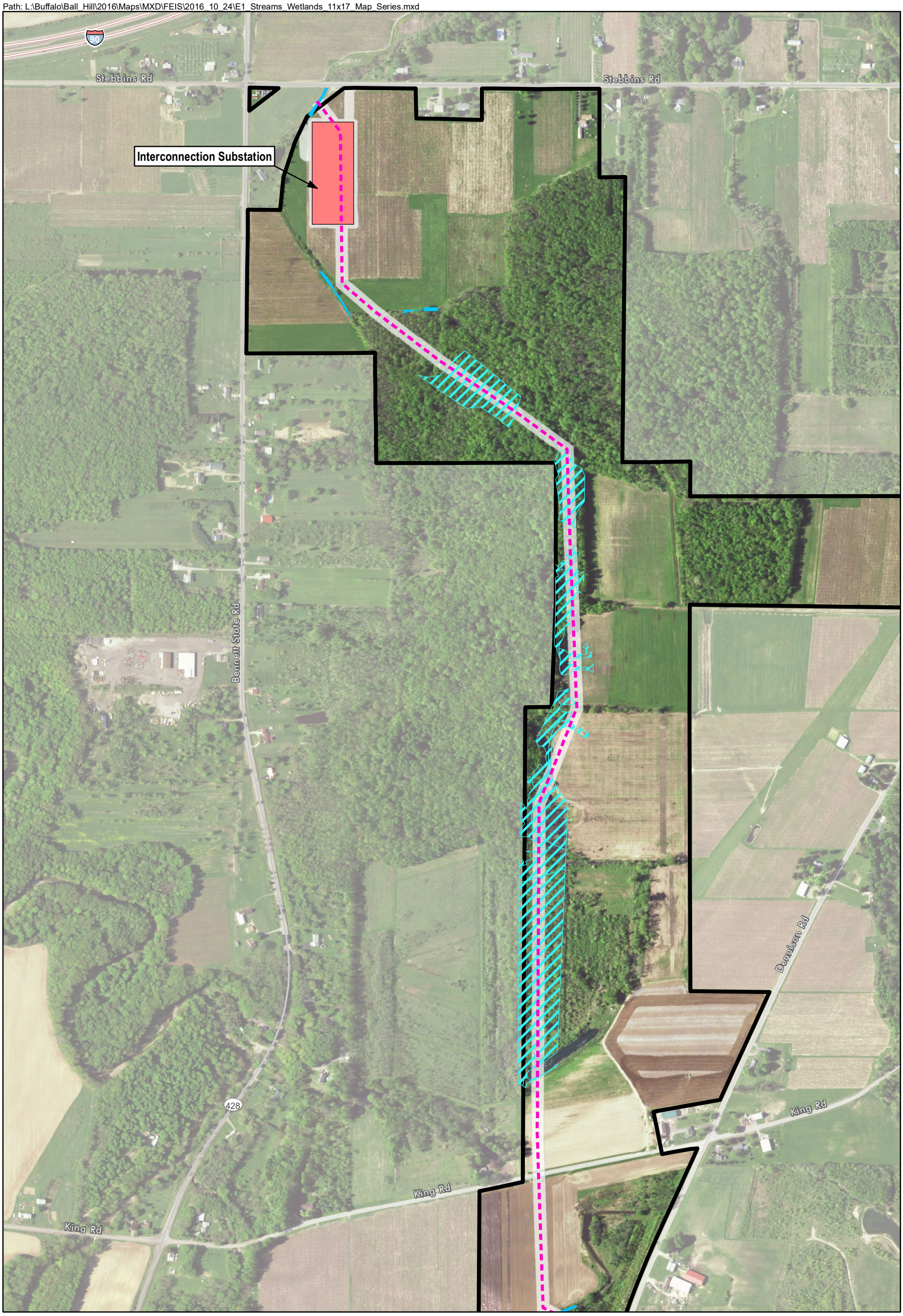
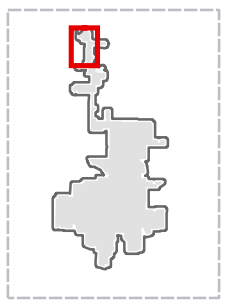


Street
Transmission Line
Interconnection Substation
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 1 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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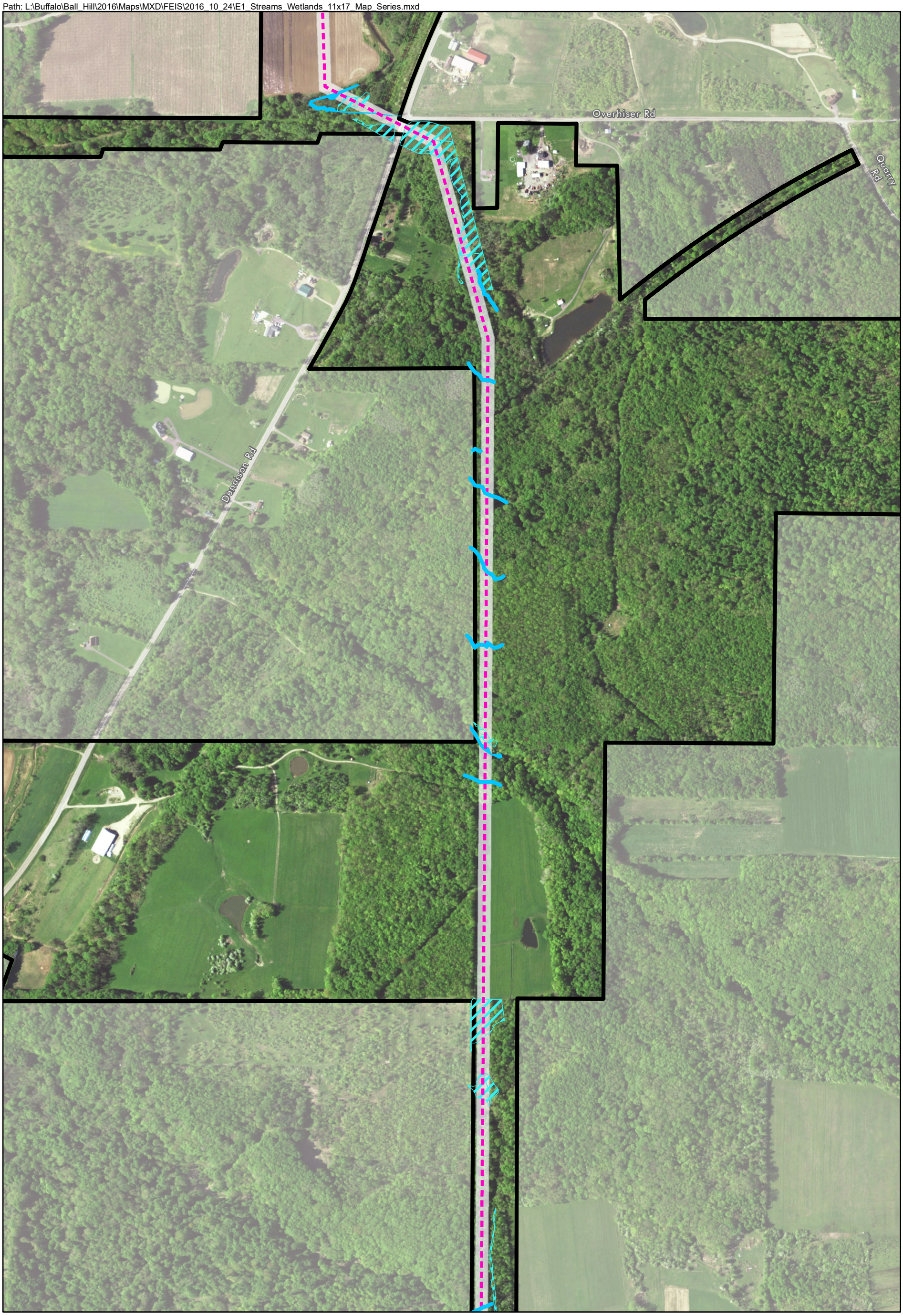
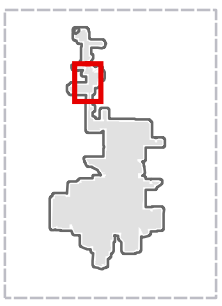


Street
Transmission Line
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Figure E-1
Project Streams and Wetlands Surveyed: Page 2 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

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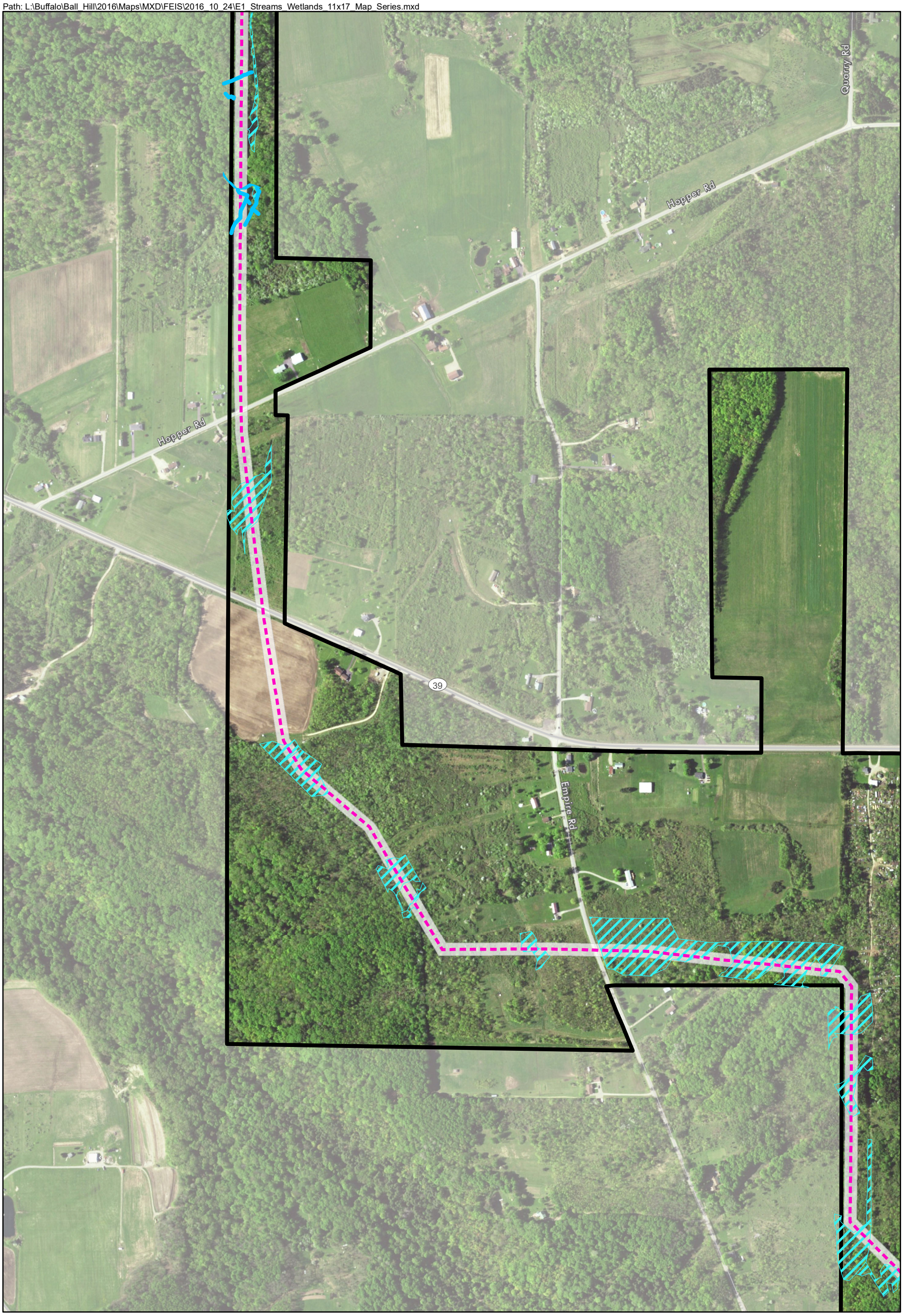
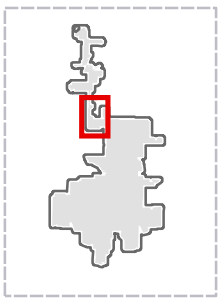


Street
Transmission Line
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Figure E-1
Project Streams and Wetlands Surveyed: Page 3 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

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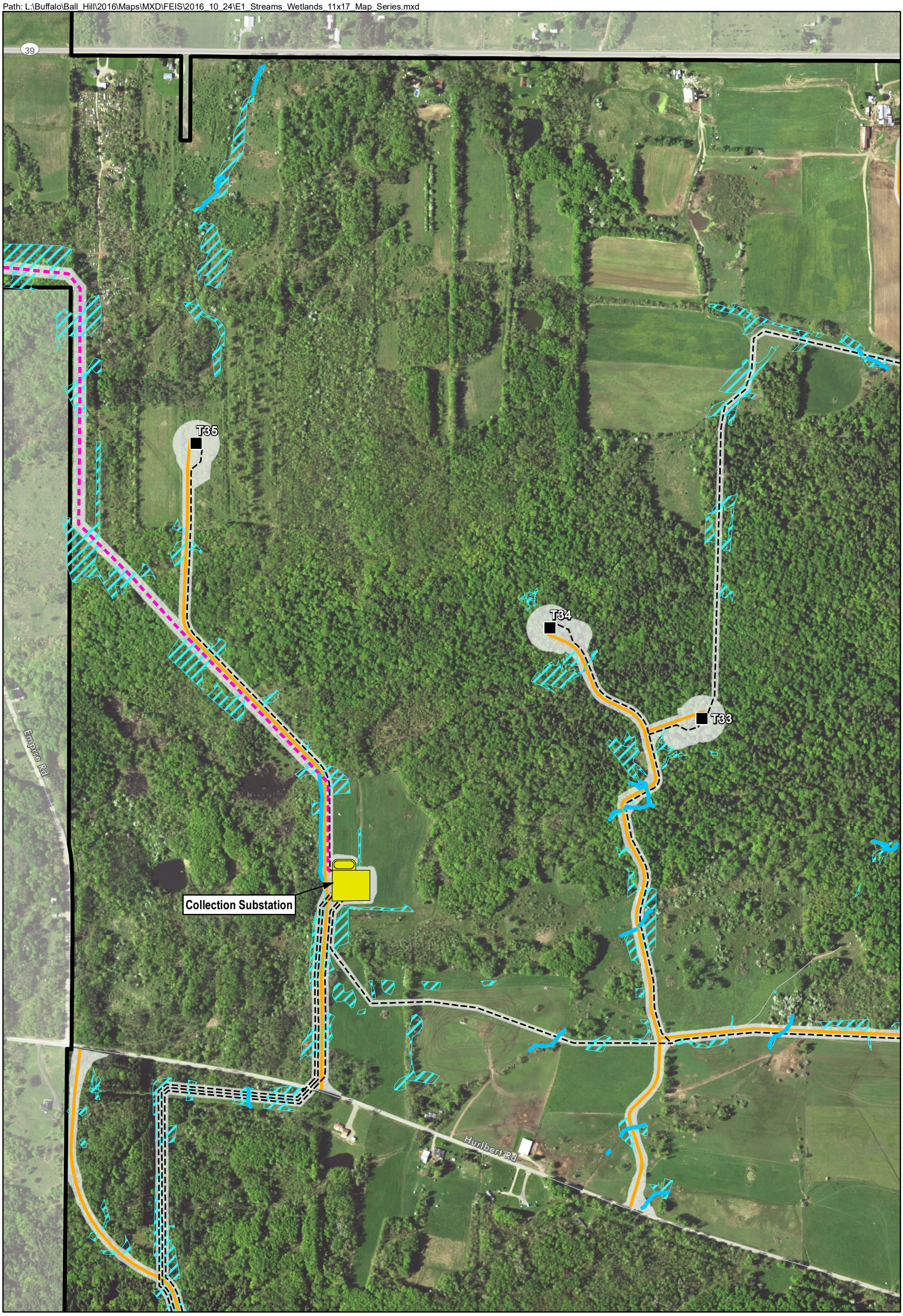
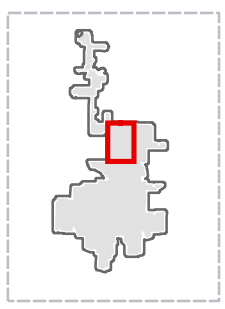


- Turbine
- Street
- Access Road
- Collection Line
- Transmission Line
- Collection Substation
- Project Area
- Limit of Disturbance (LOD)
- Delineated Stream
- Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 4 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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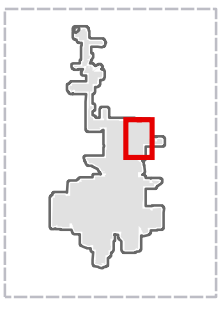
Turbine
Street
Access Road
Collection Line
Laydown Area
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 5 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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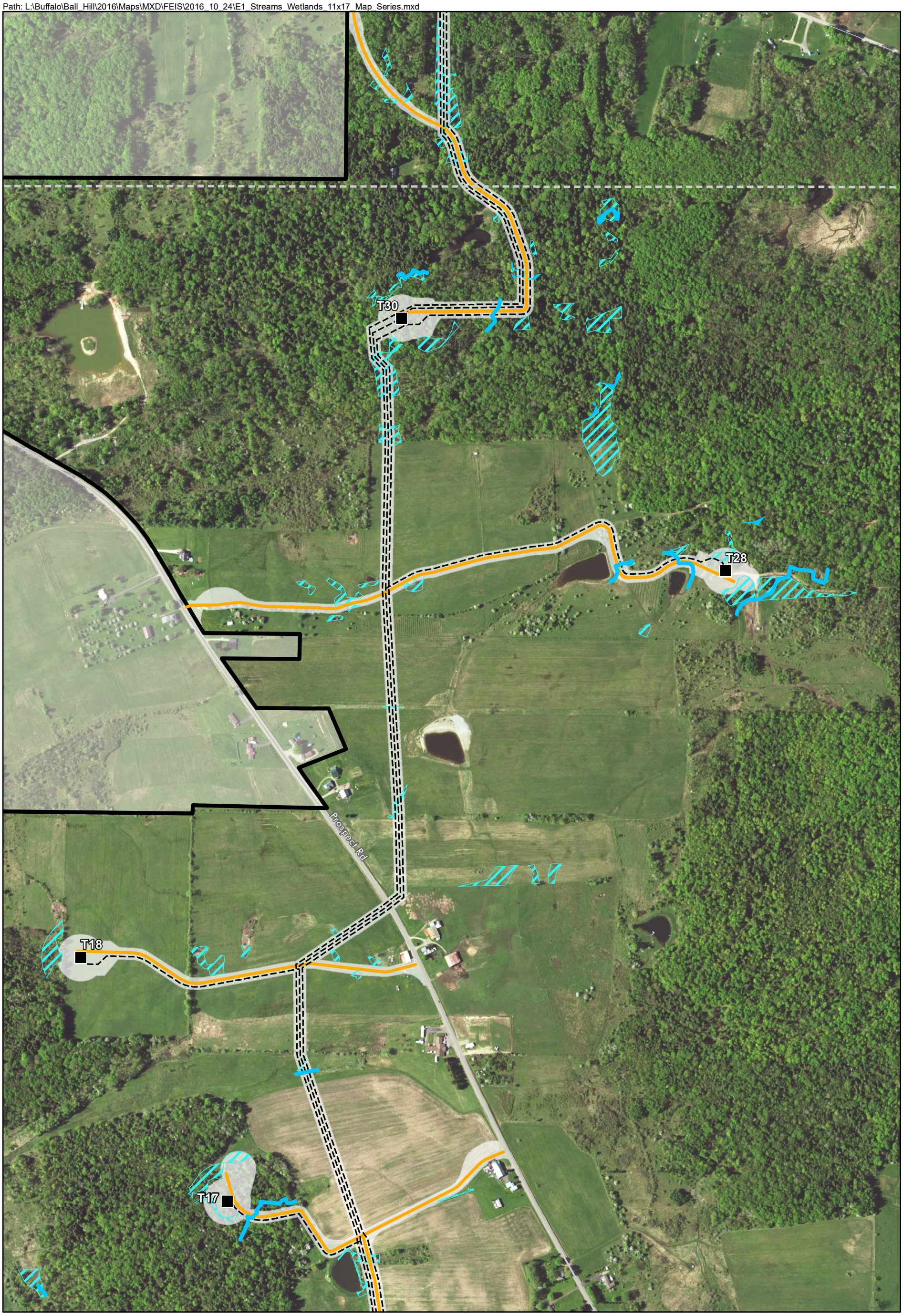
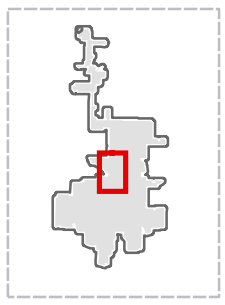


Turbine
Town Boundary
Street
Access Road
Collection Line
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 6 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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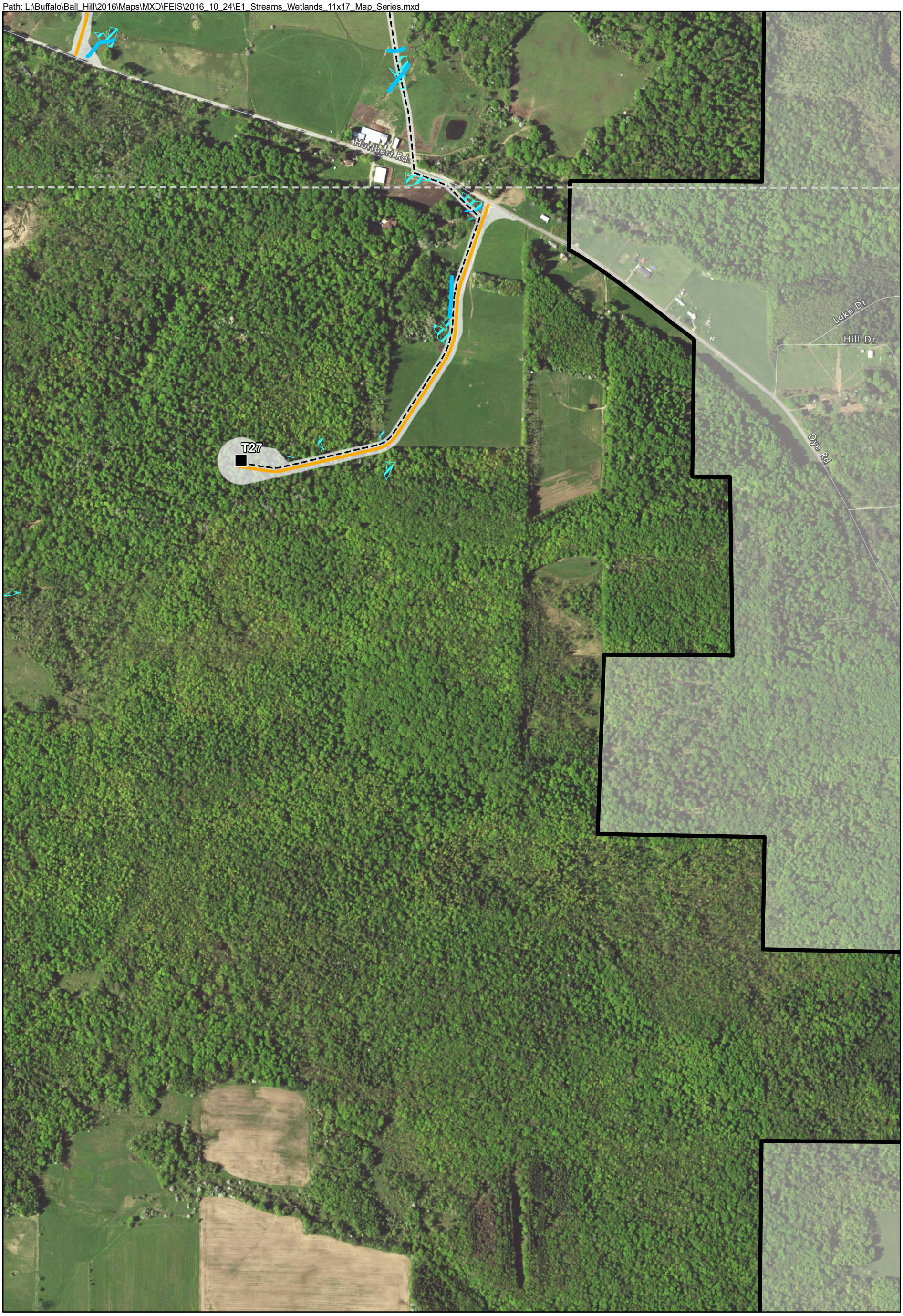
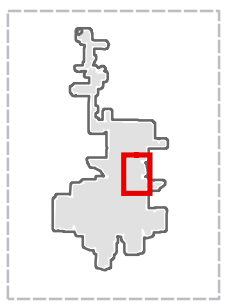


Turbine
Town Boundary
Street
Access Road
Collection Line
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 7 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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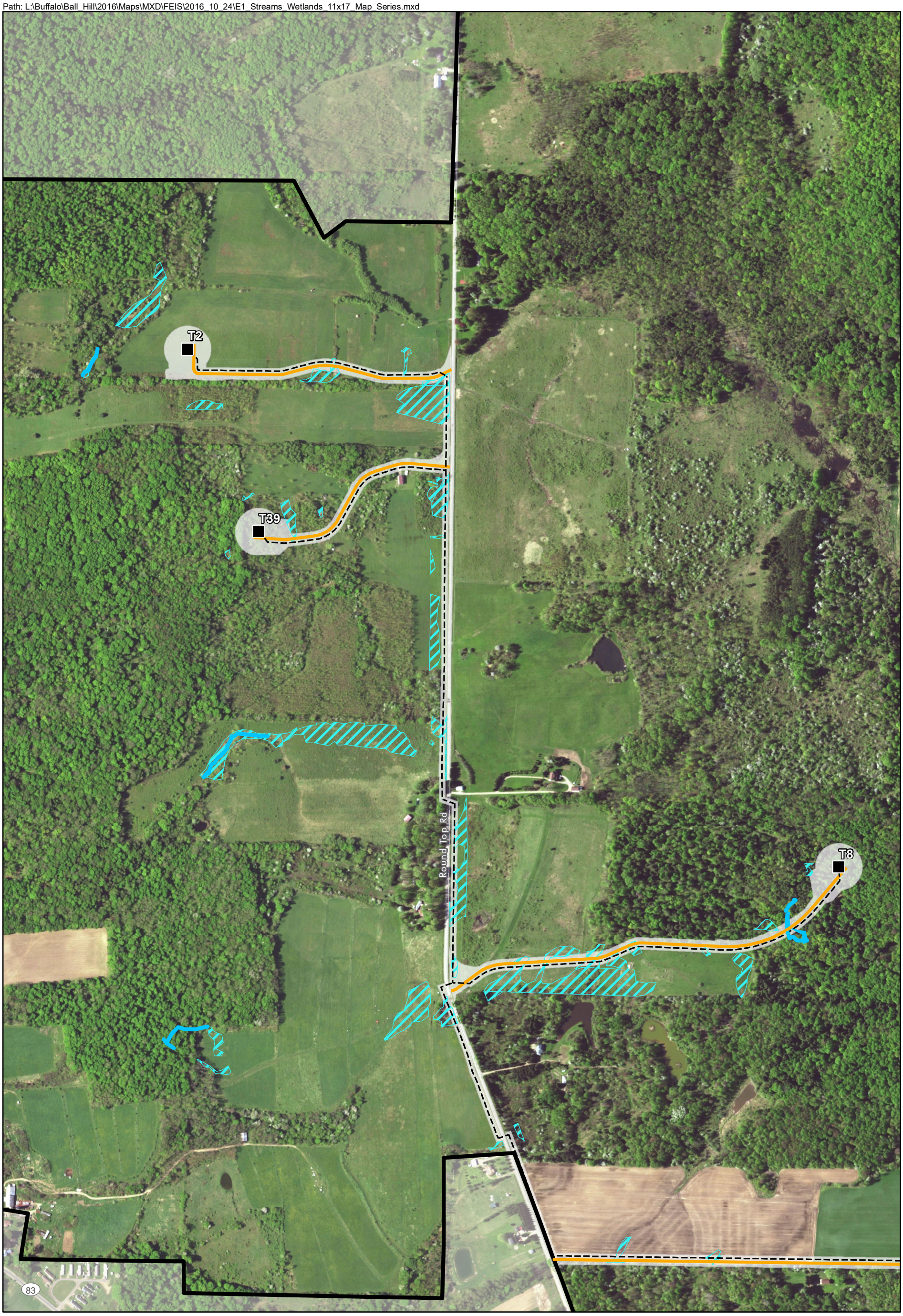
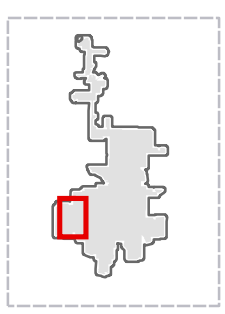


Turbine
Street
Access Road
Collection Line
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 8 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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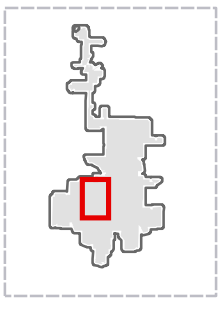
Turbine
Street
Access Road
Collection Line
Laydown Area
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 9 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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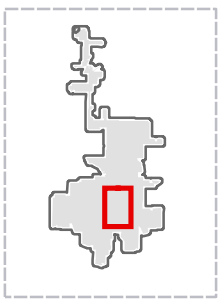
Turbine
Street
Access Road
Collection Line
O&M Building
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 10 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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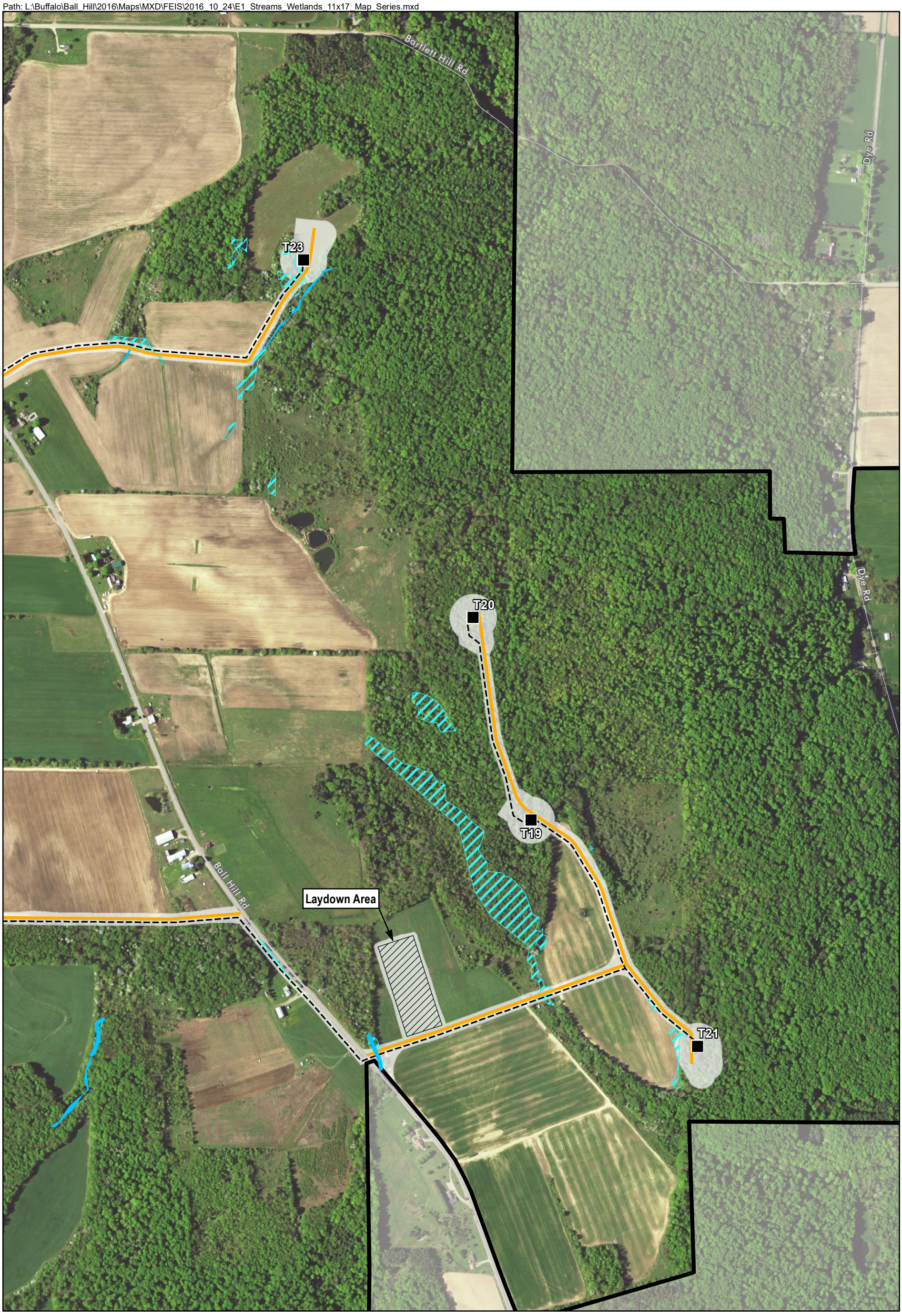
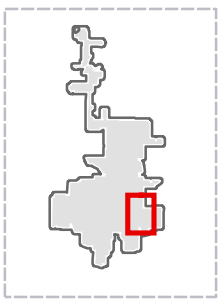


Turbine
Street
Access Road
Collection Line
Laydown Area
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 11 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

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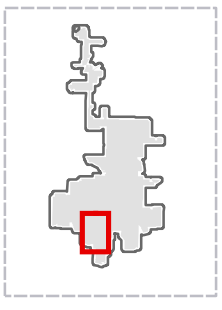
Turbine
Street
Access Road
Collection Line
Laydown Area
Project Area
Limit of Disturbance (LOD)
Delineated Stream
Delineated Wetland

Source: ESRI 2012; Fisher Associates 2016; NAIP 2015.

Figure E-1
Project Streams and Wetlands Surveyed: Page 12 of 12
Ball Hill Wind Project
Chautauqua County, New York
Ball Hill Wind Energy, LLC



0 500 1,000 Feet

Data from field surveys conducted in 2015 and 2016. Construction impacts (temporary and permanent) with respect to wetlands and streams were analyzed based on the limits of disturbance for the Project.

E.2 Wetlands

This section provides a description of delineated wetlands and a detailed discussion of the overall wetland impacts and proposed mitigation activities for wetlands from construction and operation of the Project.

Federal and State-Regulated Wetlands

Section 404 of the Clean Water Act authorizes the USACE to issue permits regulating the discharge of dredged or fill materials into the waters of the United States, including wetlands. There is no minimum size for wetlands to be regulated under federal jurisdiction; however, wetlands that do not have a hydrological connection to waters of the United States (isolated wetlands) may not be subject to federal jurisdiction. There are no regulatory maps identifying federally jurisdictional wetlands. The USACE makes a Jurisdictional Determination (JD) over wetlands as part of their permitting review.

Under Article 24 of the New York State Environmental Conservation Law, NYSDEC regulates wetlands that exceed 12.4 acres (5 hectares) in size or have unusual local importance. New York State also regulates a 100-foot upland adjacent area surrounding each regulated wetland. Work within state-regulated wetlands and the regulated adjacent area requires a permit from NYSDEC.

Activities associated with construction and operation of the Project components within the delineated wetlands are anticipated to be subject to federal and/or state regulations. Ball Hill will file appropriate permit applications with the USACE and NYSDEC and provide copies to the Town of Villenova, New York State Environmental Quality Review Act (SEQRA) Lead Agency.

Delineated Wetlands

Wetland delineation surveys were conducted in 2015 and 2016 to evaluate impacts and proposed mitigation and to support federal and state permits (see Figure E-1). Ball Hill is currently in the process of applying for a JD through a joint permit application to the USACE and NYSDEC. A wetland delineation report and request for jurisdictional determination were submitted to the USACE and NYSDEC on July 21, 2016. The USACE and NYSDEC conducted site visits to verify wetland boundaries on August 24, 2016, and September 14, 2016, respectively.

The preliminary impact analysis provided in the SDEIS was prepared utilizing data from surveys conducted in 2011, 2012, and 2015. Since that time, a wetland and waterbody delineation survey has been completed for the entire proposed facility. This updated information was used to support micro-siting of the Project to avoid and minimize impacts on streams wherever practicable. The general wetland types and conditions in the Project Area remain the same as those described in the SDEIS, though the limits of individual wetlands have changed in some instances. More detailed information regarding the data used for this wetland evaluation is included in Section E.3, Wetland Delineation Report.

For the purposes of the wetland analysis in the FEIS, federal jurisdiction is assumed for all wetlands, following the USACE protocols for Preliminary JDs (PJDs). Ball Hill has chosen to request a PJD from the USACE and, therefore, all wetlands delineated within the Project Area are assumed to be under the jurisdiction of the USACE.

A field review of NYSDEC jurisdictional wetlands was conducted in September 2016. While no unmapped NYSDEC wetlands were identified, the boundaries of two previously mapped wetlands (SC-12 and SC-13) were expanded to encompass wetlands delineated adjacent to their boundaries.

Existing Conditions

Based on review of the current wetland data, 189 wetlands totaling approximately 66.6 acres were identified during field surveys. Of the 66.6 acres of wetlands within the Project Site, 17.15 acres are palustrine forested wetlands or have a forested component, 18.05 acres are palustrine scrub-shrub wetlands or have a shrub component, and 31.39 acres are palustrine emergent wetlands. Wetlands generally receive hydrologic input from precipitation and retained surface water perched on poorly drained soils, and in lower elevations from ground and surface water connections with streams. Soils within the wetlands generally consist of silt loam texture mineral soils with low chroma and redox depletions and/or concentrations.

E.2.1 Types of Wetland Impacts

The wetland impact discussion provided in this section is broken down by 1) impacts during construction; and 2) impacts resulting from operation of the Project.

(1) Impacts during construction include all areas to be disturbed during construction activities (i.e., areas within the Project Site, including construction workspace for wind turbines, electrical collection and transmission lines, utility trenches, utility poles, access roads, staging areas, and other related structures). Construction impacts are broken down further by temporary and permanent impacts. Some wetlands are temporarily impacted by ground disturbance or placement of fill and the contours are restored following construction to allow wetlands conditions to become reestablished, but permanently impacted by forest conversion. This forest conversion is reported to clarify that where wetland contours are restored, there are some permanent impacts to wetland functions associated with the permanent loss of trees.

For the generation portion of the Project, temporary impacts include wetland impacts associated with ground disturbance activities, including mechanized clearing, filling, or excavation, where the Project Site would be restored to preconstruction contours, elevation, and wetland vegetation be allowed to become reestablished. Permanent impacts would result from permanent fill and loss of wetlands (from permanent facilities including permanent staging areas for turbines and permanent access roads), as well as permanent conversion of forested wetlands to emergent or shrub wetlands. These are described in greater detail below.

For the approximate 5.7-mile overhead electrical transmission line located between the new collection substation in the town of Hanover and interconnection substation in the town of Hanover, wetland impacts were calculated assuming a cleared 80-foot-wide permanent ROW. The total construction-related wetland impacts include the area of temporary impact during construction, the area of permanent wetland impacts associated with placement of fill for permanent facilities (those located within the footprint of any of the permanent facilities – substation or access roads), and the forested wetlands that would be cleared and permanently maintained as emergent or shrub wetlands within the electrical transmission line corridor. These are described in greater detail in Section E.2.2, Construction Impacts.

(2) Impacts during operation include only those impacts that occur or have the potential to occur after construction and restoration are complete. No foreseeable permanent impacts would occur during operation of the Project. Temporary impacts may occur as a result of maintenance activities. These are described in greater detail in Section E.2.3, Operational Impacts.

E.2.2 Construction Impacts

During Project construction, 25.83 acres of wetland would be disturbed. Tables E-2 and E-3 indicate construction impacts. Of the 25.83 acres of construction-related wetland impacts, 0.87 acres would be permanently impacted by the placement of fill and loss of wetlands; and 24.96 acres would be temporarily impacted by ground disturbance, grading, or placement of fill where preconstruction contours would be restored following construction allowing the area to return to a wetland condition. Of the 24.96 acres of wetlands subjected to temporary impacts during construction, 6.54 acres would be permanently impacted by the loss of function associated with clearing forested wetlands and maintaining them to prevent trees from becoming reestablished. A total of 0.31 acres of forested wetland would be cleared during construction and allowed to revert to a forested wetland condition over time, resulting in temporary forested wetland conversion. The remaining, 18.11 acres of wetland temporarily impacted by placement of fill are emergent and shrub wetlands that would revert to similar vegetative cover once contours were reestablished.

Table E-2 Total Wetland Impacts

Facility	Total Construction Disturbance[1] (acres)	Ground Disturbance and Placement of Fill Impacts in all Wetlands		Forested Wetland Impacts		Emergent and Scrub/Shrub Wetlands Allowed to Revert to Their Native State (acres)
		Permanent Placement of Fill[2] (acres)	Temporary Ground Disturbance and Temporary Placement of Fill[3](acres)	Permanent Impact due to Permanent Forest Conversion[4] (acres)	Temporary Forest Conversion[5] (acres)	
Total SDEIS	**29.12**	**4.64**	**24.48**	**4.25**	**3.74**	**15.91**
FEIS Impacts						
Turbines	1.37	0.07	1.30	0	0.08	1.22
Access Roads	4.52	0.80	3.72	0	0.23	3.49
Collection Line	6.50	0	6.50	0.41	0	6.09
Transmission and Sub-station	13.44	0	13.44	6.13	0	7.31
O&M Facility	0	0	0	0	0	0
Total FEIS[6]	**25.83**	**0.87**	**24.96**	**6.54**	**0.31**	**18.11**
Change from SDEIS to FEIS	**(- 3.29)**	**(- 3.77)**	**+ 0.48**	**+ 2.29**	**(- 3.43)**	**+ 2.20**

Notes:

[1] Construction disturbance includes all areas to be disturbed during construction activities; as such, they include all impacts related to clearing, temporary grading, and placement of fill. For the generation portion of the Project, this includes the acreage of all wetlands that fall within the construction ROW. For the transmission portion of the Project, this includes the acreage of all wetlands that fall within the 80-foot-wide cleared ROW, or the substation.

[2] Permanent placement of fill for both the generation portion and transmission portion of the Project refers to placement of fill within wetlands that results in a permanent loss of wetland acreage. Placement of fill includes placement of gravel fill for permanent roadways, turbine staging areas, the substation, and the O&M facility. No turbine pedestals are located within wetlands.

[3] Temporary ground disturbance and temporary placement of fill for the generation portion of the Project are defined as wetland impacts associated with filling, grading, or excavation activities where the Project Site would be restored to preconstruction contours and elevation. Temporary impacts for the transmission portion of the Project include any portion of a wetland within the 80-foot-wide cleared ROW that is not permanently filled. Additionally, this also includes impacts associated with filling, grading, or excavation activities of the substation where the Project Site would be restored to preconstruction contours and elevation.

[4] Permanent forest conversion includes area where forested wetlands would be cleared and not be allowed to naturally regenerate to forested wetlands, but rather be maintained in a scrub-shrub or emergent state. For the generation portion of the Project, this includes all electrical collection line ROWs. For the transmission portion of the Project, this would include all portions of forested wetlands that fall within the 80-foot-wide cleared ROW.

[5] Temporary forest conversion includes areas where forested wetlands would be cleared and would be allowed to naturally regenerate to a forested wetlands. For the generation portion of the Project, this includes areas within the grading area needed around the turbine but outside the permanent impacts from the foundation and crane pad.

[6] Due to rounding, totals may not reflect the sum of numbers.

Table E-3 Impacts on NYSDEC Wetlands and Jurisdictional 100-foot Buffer Area

Facility	Total Construction Disturbance in NYSDEC Wetlands[1] (acres)	Ground Disturbance and Placement of Fill Impacts in NYSDEC Wetlands		Forested NYSDEC Wetland Impacts		Total Construction Disturbance in NYSDEC Adjacent Areas[1] (acres)	Ground Disturbance and Placement of Fill Impacts in NYSDEC Adjacent Areas		Forested NYSDEC Adjacent Area Impacts	
		Permanent Placement of Fill[2] (acres)	Temporary Ground Disturbance and Temporary Placement of Fill[3] (acres)	Permanent Impact due to Permanent Forest Conversion[4] (acres)	Temporary Forest Conversion (acres)[5]		Permanent Placement of Fill[2] (acres)	Temporary Ground Disturbance and Temporary Placement of Fill[3] (acres)	Permanent Impact due to Permanent Forest Clearing[4] (acres)	Temporary Forest Clearing[5] (acres)
SDEIS Totals	**5.90**	**0**	**5.90**	**2.82**	**0**	**3.33**	**0**	**3.33**	**1.55**	**0**
FEIS Impacts										
Turbines	0	0	0	0	0	0	0	0	0	0
Access Roads	0	0	0	0	0	0	0	0	0	0
Collection Line[5]	0	0	0	0	0	0	0	0	0	0
Transmission and Substation	5.90	0	5.90	2.82	0	3.33	0	3.33	1.55	0
O&M Facility	0	0	0	0	0	0	0	0	0	0
FEIS Total	**5.90**	**0**	**5.90**	**2.82**	**0**	**3.33**	**0**	**3.33**	**1.55**	**0**
Change from SDEIS to FEIS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Notes:

[1] Construction disturbance includes all areas to be disturbed during construction activities; as such, they include all impacts related to clearing, temporary grading, and placement of fill. For the generation portion of the Project, this includes the acreage of all wetlands that fall within the construction ROW. For the transmission portion of the Project, this includes the acreage of all wetlands that fall within the 80-foot-wide cleared ROW or the substation.

[2] Permanent placement of fill for both the generation portion and transmission portion of the Project refer to placement of fill within wetlands that results in a permanent loss of wetland acreage. Placement of fill includes placement of gravel fill for permanent roadways, turbine staging areas, the substation, and the O&M Facility. No Turbine pedestals are located within wetlands.

[3] Temporary ground disturbance and temporary placement of fill for the generation portion of the Project are defined as wetland impacts associated with filling, grading, or excavation activities where the Project Site would be restored to preconstruction contours and elevation. Temporary impacts for the transmission portion of the Project include any portion of a wetland within the 80-foot-wide cleared ROW. Additionally, this also includes impacts associated with filling, grading, or excavation activities of the substation where the Project Site would be restored to pre-construction contours and elevation.

[4] Permanent forest conversion/clearing includes where forested wetlands/forested adjacent area would be cleared and not be allowed to naturally regenerate to a forested wetland/forested adjacent area, but rather be maintained in a scrub-shrub or emergent/herbaceous state. For the generation portion of the Project, this includes all electrical collection line ROWs. For the purpose of this calculation, any clearing associated with access roads co-located with either collection lines has been included in this number. For the transmission portion of the Project, this would include all portions of forested wetlands that fall within the 80-foot-wide cleared ROW.

[5] Temporary forest conversion/clearing includes where forested wetlands/forested adjacent area would be cleared and would be allowed to naturally regenerate to a forested wetland/forested adjacent area. For the generation portion of the Project, this includes areas within the grading limits of the turbine but outside the foundation and turbine crane pad.

Of the wetlands impacted along the proposed transmission line, 5.9 acres are mapped as NYSDEC wetlands (SC-12, a Class II wetland; and SC-13, a Class III wetland), which would be temporarily impacted by ground disturbance during the installation of the line. Of the 5.91 acres of wetland temporarily subjected to ground disturbance or fill, 2.82 acres would be permanently converted from a forested wetland to an emergent or shrub wetland. In addition, construction of the transmission line ROW would impact 3.33 acres of the adjacent 100-foot upland buffer surrounding the state wetlands, of which 1.55 acres would be permanently converted from forested cover to grassland or shrub cover.

E.2.3 Operational Impacts

Impacts on wetlands may occur along collection and transmission components of the Project during maintenance to clear vegetation or during access for maintenance. In the event that future temporary impacts may occur as the result of maintenance activities, Ball Hill would obtain necessary permits from the USACE and NYSDEC on an as-needed basis.

Summary of Impacts

Construction of the Project (i.e., access roads, collection lines, transmission lines, laydown and O&M areas, and turbine sites) would result in total construction disturbance of 25.83 acres of wetlands, 0.87 acres of which would be permanently impacted by placement of fill associated with turbine staging areas, access roads, and the transmission substation. The remaining 24.96 acres of wetlands would be limited to temporary ground disturbance impacts or permanent impacts associated with conversion of forested wetlands to an herbaceous or scrub-shrub state. Of the wetlands impacted along the transmission line, 5.91 acres are mapped as NYSDEC wetlands (SC-12, a Class II wetland; and SC-13, a Class III wetland) that would temporarily subjected to ground disturbance or fill. A total of 2.82 acres would be permanently converted from a forested wetland to an emergent or shrub wetland. In addition, construction of the transmission line ROW would impact 3.33 acres of the adjacent 100-foot upland buffer surrounding the state wetlands, of which, 1.55 acres would be permanently converted from forested cover to grassland or shrub cover. Impacts on streams are described separately (see Section E.1, Water Quality). The permanent impacts on 0.87 acres of wetlands are associated with several wetlands that are located along access roads (0.8 acres) and associated with turbine staging areas (0.07 acres). All other Project facilities, including the switchyard and all turbine foundations, are located outside of delineated wetlands.

Temporary impacts consist of 24.96 acres of wetland that would be temporarily impacted by grading, ground disturbance, or placement of fill during construction and would be returned to preconstruction contours and allowed to revegetate to scrub-shrub or emergent cover. All of these wetland impacts are assumed to be under federal jurisdiction for the purposes of the FEIS. The majority of wetlands subject to temporary clearing within the construction ROW are herbaceous and scrub-shrub wetlands (18.11 acres), which are expected to quickly revert to their preconstruction conditions. Some areas that are currently forested wetlands

would be temporarily cleared during construction to allow for safe construction at turbine sites, but would be allowed to revert to a forested wetland condition over time (0.31 acres).

Operation of the generation and transmission facilities could result in temporary impacts to wetlands associated with clearing to maintain ROWs for the transmission line and collection lines as well as temporary impacts to wetlands for maintenance access. Total wetland impacts for the entire Project are listed in Table E-2. Impacts on state jurisdictional wetlands are presented in Table E-3.

E.2.4 Mitigation

Ball Hill had an intensive multi-phased siting process to avoid and minimize potential impacts on wetlands, and considered siting factors that include topography, location of wetlands and other sensitive resources, availability of sufficient wind resources, proximity to existing roads and transmission lines, locations of residential dwellings, potential impacts from noise, and landowner access agreements. Each factor imposed limitations on the amount of flexibility available during the turbine siting process. Once these factors are considered, turbines and ancillary facilities (i.e., roads and collection system) are sited to avoid and/or minimize environmental impacts. Ball Hill made every effort to use previously disturbed areas, such as farmlands and roads, and avoid wetland and stream crossings. Despite an extensive effort to entirely avoid wetland impacts, because of other constraints and the linear nature of some Project components, it is not possible to design the Project without some impacts on wetlands while still meeting Project objectives. The process that was completed to avoid and minimize wetland impacts in the design of this Project is described below.

Avoidance and Minimization of Wetlands Impacts through Study and Careful Siting

Multiple wetland studies and delineations were previously completed for the Project to determine the extent and quality of wetlands that could potentially be impacted by the Project. Previous wetland studies included a desktop review of existing wetland location information and mapping, reconnaissance-level wetland surveys, and detailed wetland delineations in 2008. Since that time, additional rounds of wetland delineations were conducted in 2011/2012. These previous studies confirm that wetlands under state and federal jurisdiction exist within the Project Site and provide information on the extent and quality of those wetlands. Updated wetland delineations began in 2015 and were completed in 2016. Each phase of the wetland delineations was used to determine changes in the wetlands in the Project Site and refine siting for the Project components to avoid and/or minimize impacts on wetlands while balancing impacts on other resources. The results of 2015/2016 updated wetland delineations were used to further refine siting and avoid and minimize wetland impacts. The delineated wetland boundaries for the Project were added to facility mapping and used to further refine the location of turbine sites, roads, electrical collection lines, the transmission line and substation, and the O&M building to avoid and minimize impacts on wetlands to the extent practicable.

Minimization of Impacts during Construction and Operation of the Project

In addition to careful siting and avoidance of impacts as described above, Ball Hill will employ various other mitigation measures to minimize impacts on wetlands to the maximum extent practicable. For example, the size of access roads and collection and transmission line equipment access corridors within wetlands can be restricted to the minimum width necessary to safely and effectively construct and transport equipment to the turbine sites. The size and weight of the wind turbine components require a stable road surface free of obstructions, thus dictating the amount of woody vegetation that must be cleared and the size of the construction access roads. Roads will be gravel-based and will not have any impermeable top coating. Appropriately sized culverts will be used to maintain the hydrologic connectivity of the wetlands. Where possible, access road crossings have been co-located with existing crossings; therefore, the opportunity may exist to improve the connectivity of wetland areas where existing roads do not have adequate culverts or crossings.

During construction and restoration of the Project Site, BMPs would be implemented to minimize impacts on the wetland resource and, where applicable, the associated NYSDEC 100-foot upland adjacent area. These practices include stripping and stockpiling the wetland topsoil separate from subsoil layers during grading operations; use of geotextile fabric and/or crossing mats to minimize soil compaction; and installation of appropriately designed culverts to maintain wetland hydrology.

Ball Hill would utilize BMPs while installing underground collection cables. Trench plugs would be used, as appropriate, and installed immediately after cable laying and prior to trench backfilling, in order to maintain existing hydrological conditions. In areas where underground collection lines are not co-located with access roads, Ball Hill will return these wetlands to preconstruction grades and allow for the natural recruitment of plants into the underground collection corridor.

Ball Hill will follow all NYSDEC and USACE permit requirements regarding restoration of wetland impacts and employ an environmental monitor during construction. An Invasive Species Management Plan (ISMP) will be fully developed in consultation with NYSDEC and the USACE prior to the onset of construction activities. A draft ISMP is included in Appendix S as part of the EMP. The ISMP discusses measures to prevent the spread or introduction of invasive species into the Project Site, measures to control existing invasive communities, and long-term monitoring procedures.

Maintenance activities associated with Project would include: routine maintenance of wind turbines; collection and transmission line service; selective vegetative pruning around components; and access road maintenance. All chemical

treatments will be undertaken in accordance with all manufacturer guidelines and federal, state, and local laws.

Ball Hill would implement a SWPPP in accordance with NYSDEC permit requirements, which would include an Erosion and Sediment Control Plan and BMPs designed to minimize impacts on those wetlands crossed. During construction operations through permitted wetland areas, BMPs, such as silt fencing, straw bale barriers, or temporary rock sediment traps, would be installed to minimize off-site migration of Project-related sediment.

Mitigation for Permanent Impacts

For those wetland impacts that cannot be avoided, Ball Hill anticipates that mitigation will be required as a condition of the wetland disturbance permits required prior to construction. Within the NYSDEC and USACE permitting requirements, compensatory mitigation can only be considered after the Project proponent demonstrates avoidance and minimization to the extent possible. A Conceptual Wetland Mitigation Plan has been developed and is provided in Appendix F. This appendix outlines the proposed mitigation strategy for the Project and the proposed mitigation techniques that will be implemented in order to meet the requirements for compensatory mitigation consideration. This document will serve as the baseline for a Final Mitigation Plan, which will be developed in consultation with the USACE and NYSDEC during the course of their respective permitting processes.

Mitigation will be required for unavoidable, permanent fill impacts on regulated wetlands (wetland loss) and for loss of function associated with permanent conversion of forested wetlands (loss of wildlife habitat). Based on USACE guidance, mitigation can be completed either financially, in the form of in-lieu-fee mitigation, land acquisition for preservation purposes, regional mitigation banking; or in the form of a specific wetland restoration, creation, or enhancement project developed in conjunction with the Project. It is anticipated that the permanent loss of wetlands under the jurisdiction of the USACE as a result of fill and conversion impacts will be mitigated through the purchase of in-lieu fee mitigation credits. The number of credits from an approved in-lieu fee mitigation provider to offset the proposed permanent impacts (0.87 acres) will be determined through the permitting process with NYSDEC and the USACE.

NYSDEC regulations do not allow for the use of in-lieu fee mitigation to offset Project impacts. The Conceptual Wetland Mitigation Plan, provided in Appendix F, accounts for the permanent loss of wetland functions and values provided by the impacted NYSDEC jurisdictional wetlands. The goal of the mitigation plan is to restore, create, and/or enhance wetland hydrology, and vegetation to adequately offset the loss of function and value to the jurisdictional wetlands on the site resulting from Project implementation. As the impacts to NYSDEC Freshwater Wetland (FWW) SC-12 and SC-13 will be limited to conversion of forested wetlands and upland adjacent areas to areas maintained in a scrub-shrub or emergent/grassland state, the proposed mitigation focuses on recreation of the lost for-

est cover in areas adjacent to the impacted wetlands. The restoration/enhancement effort will require a minimum of 1:1 replacement of lost forest cover, with the final ratio determined as part of the permitting process. The Conceptual Wetland Mitigation Plan proposes planting approximately 2.8 acres of wetland tree species and 1.5 acres of upland tree species within areas currently maintained as active and fallow agricultural fields (see Appendix F). A Final Wetland Mitigation Plan will be developed in conjunction with NYSDEC and the USACE as part of the Joint Application for Permit process and provided to the Towns upon completion.

E.3 Wetland Delineation Report

PREPARED FOR:

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BALL HILL WIND PROJECT

WETLAND DELINEATION REPORT

JULY 2016
REVISED OCTOBER 2016

PREPARED BY:

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FISHER ASSOCIATES PROJECT NO. 150001

EXECUTIVE SUMMARY

On behalf of Ball Hill Wind Energy LLC, Fisher Associates conducted a field delineation between October 26 to November 20, 2015 and May 19 to July 15, 2016 to identify jurisdictional Waters of the U.S. (WUS) including wetlands and streams within the Project Study Limits defined to support of the Ball Hill Wind Project ("Project"). The Project Study Limits consist of a 665.38-acre area, which encompasses potential construction and limits of disturbance required for the Project. The Project Study Limits are depicted on the attached Wetland Delineation mapping.

The Project Study Limits are located in Chautauqua County and consist of proposed turbine locations in addition to associated infrastructure including access roads, collection lines, transmission line, switch yard, construction staging areas, operations and maintenance support areas, and an utility-scale substation. The northern portion of the Project is located within the Chautauqua-Conneaut Watershed (HUC 04120101) and the southern portion of the Project is located within the Conewango Watershed (HUC 05010002). The Project is drained by Tupper Creek and unnamed contributing tributaries to the North Branch of Conewango Creek, Silver Creek, Tupper Creek, Walnut Creek, and the West Branch of Conewango Creek.

The Project Study Limits were delineated based upon the methodology outlined in the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0). Using these methodologies, preliminary delineation mapping was produced and is included along with the attached investigation description and discussion. During our delineation, approximately 66.60 acres of combined palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO) wetlands were identified. In addition, 11,648 linear feet of stream channel and 8,345 linear feet of jurisdictional ditches were identified.

Based on conditions observed, the USACE will likely invoke jurisdiction of all identified wetlands, stream reaches, and jurisdictional ditches due to their apparent hydrologic connection to other waters. It is also anticipated that the NYSDEC will invoke jurisdiction over the delineated wetlands under Article 24 of the Environmental Conservation Law (ECL) that are associated with NYSDEC Wetlands SC-12 (delineated wetlands A593 and A594) and SC-13 (delineated wetlands A643 and A644). It is not anticipated that the NYSDEC will invoke jurisdiction over the additional wetland systems identified as they are not within close proximity (i.e., less than 50 meters) of Wetlands SC-12, SC-13, or other mapped NYSDEC wetlands and their regulated 100-foot adjacent areas. NYSDEC will likely invoke jurisdiction over 17 of the 63 stream reaches delineated within the Project Study Limits under Article 15 of the ECL, as they are recognized as Class A streams. NYSDEC is not anticipated to invoke jurisdiction over the remaining 46 stream reaches or jurisdictional ditches identified under Article 15 of the ECL, as they are recognized as either Class C or D streams.

WETLAND DELINEATION REPORT
BALL HILL WIND PROJECT

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PROJECT INFORMATION SHEET

General

Project Name:	Ball Hill Wind Project
State:	New York
County:	Chautauqua County
Towns:	Villenova and Hanover
Latitude:	42.440000 North
Longitude:	-79.128000 West
Project Study Area Size:	656.56 acres
HUC Code:	04120101 (Chautauqua-Conneaut Watershed) and 05010002 (Conewango Watershed)
Waterbodies (TNW):	Tupper Creek; unnamed contributing tributaries to the North Branch of Conewango Creek, Silver Creek, Tupper Creek, Walnut Creek, and the West Branch of Conewango Creek; and associated palustrine emergent, scrub-shrub, and forested wetlands

Corresponding Information

USGS Quad Map:	Silver Creek, Forestville, and Perrysburg
USDA Soils Map:	Chautauqua County

Owner/Applicant

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1.0 INTRODUCTION

On behalf of Ball Hill Wind Energy LLC, Fisher Associates conducted a field delineation between October 26 to November 20, 2015 and May 19 to July 15, 2016 to identify jurisdictional Waters of the U.S. (WUS) including wetlands and streams within the Project Study Limits defined to support of the Ball Hill Wind Project ("Project"). The Project Study Limits consist of a 665.38-acre area, which encompasses potential construction and limits of disturbance required for the Project. The Project Study Limits are depicted on the attached Wetland Delineation mapping.

2.0 SITE INFORMATION

2.1 Site Location

The Project Study Limits are located in the Towns of Villenova and Hanover in Chautauqua County in southwestern New York. The northern portion of the Project is located within the Chautauqua-Conneaut Watershed (HUC 04120101) and the southern portion of the Project is located within the Conewango Watershed (HUC 05010002). The Project is drained by Tupper Creek and unnamed contributing tributaries to the North Branch of Conewango Creek, Silver Creek, Tupper Creek, Walnut Creek, and the West Branch of Conewango Creek. The Project is located in the Eastern Lake Section of the Central Lowland Physiographic Province and the Southern New York Section of the Appalachian Plateaus Physiographic Province.

2.2 Site Description

The Project Study Limits consist of proposed turbine locations in addition to associated infrastructure including access roads, collection lines, transmission line, switch yard, construction staging areas, operations and maintenance support areas, and an utility-scale substation. The areas within the Project Study Limits consist of mix of active agricultural lands and mixed deciduous forest within a rural setting (see Wetland Delineation Map Index and Wetland Delineation Map, Sheets 1 through 101).

3.0 METHODS OF DELINEATION

3.1 Preliminary Offsite Investigation/Data Review

A review of publicly available resources was performed prior to the onsite field investigation in order to determine if there is the potential for jurisdictional areas, and if present, the extent of these areas located within the Project Study Limits. These mapping resources generally include but are not limited to:

- New York State Freshwater Wetlands Mapping (NYSFW);
- New York State Protection of Waters Regulatory Program Streams Mapping (NYSS);
- U.S. Fish & Wildlife Service National Wetlands Inventory (NWI) Database;
- U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) Soils Database; and
- United States Geographical Survey (USGS) Mapping.

3.2 Field Investigation

Wetland boundaries were field delineated according to the routine onsite methodology described in the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0).

Wetlands were identified based on the presence of hydric soils; a vegetative community dominated by hydrophytes, and inundated or saturated conditions, and/or indicators of hydrologic patterns. Fisher Associates delineated and flagged the wetland boundary with consecutively numbered delineation flagging where vegetation and conditions were conducive to the establishment of field flagging. In areas of the Project Study Limits that are maintained through mowing or previously harvested agricultural row crops, field flagging was not established due to a lack of vegetation to hold field marking flags. Similarly, in areas which were actively accessible to livestock, field flagging was not established to protect the wellbeing of the livestock which could potentially consume the field flagging. A project-specific identification number was given to each delineated wetland. Wetland delineation data relative to vegetation, hydrology, soils and general observations was documented on routine wetland data forms consistent with the guidance of the 2012 Regional Supplement.

Wetland field data points were established within close proximity to the flagged wetland boundary in order to document upland and wetland conditions existing along the wetland boundary. The aquatic resource boundaries were flagged in the field and the flagged locations were surveyed to further clarify their locations.

Stream channels, tributaries, and linear conveyance features were identified based on the recognition of field indicators of bed, banks, and an ordinary high water mark coupled with an evaluation of downstream flow. Wetland Delineation Maps depicting the location of the delineated wetlands and any additional jurisdictional features, including streams, identified within the Project Study Limits are provided as an attachment. Supporting wetland determination data forms are provided in Appendix A and supporting stream data forms are provided in Appendix B.

4.0 DELINEATION FINDINGS

4.1 Preliminary Offsite Investigation/Data Review Findings

4.1.1 NYS Freshwater Wetland Mapping

The NYSFW maps were developed by the New York State Department of Environmental Conservation (NYSDEC) pursuant to Article 24 of the Environmental Conservation Law. These maps depict the approximate boundaries of freshwater wetlands regulated by the NYSDEC. In most instances, the State-mapped boundaries are based on aerial photographs and soil survey interpretation and, therefore, require site-specific field verification. Freshwater wetland mapping information identified for the Project Study Limits was obtained from online Geographic Information System (GIS) mapping resources made available by the NYSDEC (NYSDEC 2015). Based on reviewed mapping information, NYSDEC Wetland SC-12 (Class II) and SC-13 (Class III) are mapped within the Project Study Limits.

4.1.2 NYS Streams Mapping

The NYSS maps were developed by the NYSDEC pursuant to Article 15 of the Environmental Conservation Law. These maps depict the approximate locations of streams mapped by NYSDEC and identify their respective state water quality classification and standard designations based on existing or expected best usage of each water segment. In most instances, the mapped stream locations are based on aerial photographs and topographic map interpretation and, therefore, require site-specific field verification. Stream mapping information identified for the Project Study Limits was obtained from online Geographic Information System (GIS) mapping resources made available by the NYSDEC (NYSDEC 2015). Based on reviewed mapping information, NYSS mapped steams are present within the Project Study Limits. There are twenty-nine (29) occurrences of NYSS mapped streams including eleven (11) Class A streams and eighteen (18) Class C streams.

4.1.3 National Wetlands Inventory Mapping

NWI mapping information for the Project Study Limits was obtained from online GIS mapping resources made available by the USFWS (USFWS 2015). A review of this information was completed which indicated that eight (8) mapped NWI wetlands, including Cowardin Classifications of PFO1E (palustrine forested broad-leaved seasonally flooded/saturated), PFO1/SS1E (palustrine forested/scrub-shrub broad-leaved seasonally flooded/saturated), PEM5E (palustrine emergent seasonally flooded/saturated), and PUBHx (palustrine unconsolidated bottom permanently flooded excavated), are mapped within the Project Study Limits. However, it is understood that this mapping is provided as a reference and is not necessarily indicative of the presence or absence of wetlands in an area.

4.1.4 Soils Mapping

Soil types identified for the Project Study Limits were obtained from online GIS mapping resources made available by the NRCS (USDA-NRCS 2015). A review of this information was completed to evaluate the soil types within the Project Study Limits to determine the possible presence of hydric soils.

The mapped soils at each wetland location, including instances where there may be more than one soil component identified at a given wetland location, are described in Table 1: Wetland Delineation Summary. Areas of predominantly hydric soils were identified within the Project Study Limits. The mapped soils present within the Project Study Limits are depicted in the attached Wetland Delineation Mapping.

4.2 Onsite Determination/Findings

4.2.1 Wetland Area Summary

The onsite delineation did verify the presence of wetlands and confirmed the presence of hydric soils depicted on the NRCS soils mapping. 66.60-acres of combined palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO) wetlands were identified. A summary of the wetlands identified within the Project Study Limits is provided in Table 1:

Wetland Delineation Summary. The location and size of wetlands delineated onsite are shown on the attached Wetland Delineation Mapping.

4.2.1.1 Wetland Vegetation

The criterion for wetland vegetation is a dominance of hydrophytic species. A species is considered hydrophytic per USACE (1987 and 2012) if it is classified either as obligate (OBL), facultative wet (FACW), or facultative (FAC) in *The National Wetland Plant List: 2014 Update of Wetland Ratings* (Lichvar, et.al, 2016). A dominance of hydrophytes requires that more than 50% of the vegetative species in an area are classified as hydrophytic.

Generally, the delineated wetlands consisted of palustrine emergent wetlands within active agriculture fields which are either cultivated or pastured by livestock. Lesser areas of forested and scrub-shrub wetlands were identified in areas that were generally not subject to active agriculture or livestock pasturing. The wetland determination data forms which provide expanded detail of the wetlands identified within the Project Study Limits can be found in Appendix A. Wetland vegetation community cover types observed at each wetland are summarized in Table 1: Wetland Delineation Summary.

4.2.1.2 Wetland Hydrology

The Project Study Limits were examined for field indicators of wetland hydrology. According to USACE (1987 and 2012), wetland hydrology consists of permanent or periodic inundation, or soil saturation to the surface during the growing season. If these indicators were present within the sample plots, the hydrology criterion was met.

Generally, wetlands identified within the Project Study Limits receive hydrologic input from precipitation and retained surface water perched upon poorly drained soils containing fine sediments and shallow restrictive layers. In addition, wetlands within lower elevations of the project watersheds exhibited a direct groundwater connection and often additional shared surface hydrology in association with adjacent and contiguous streams. Hydrologic indicators observed at each delineated wetland were recorded on the wetland determination data forms presented in Appendix A. Table 1: Wetland Delineation Summary provides the location (latitude/longitude) and total wetland area delineated within the Project Study Limits.

4.2.1.3 Wetland Soils

Soil physical characteristics were evaluated during the field delineations by excavating to a depth appropriate to evaluate potential hydric soil indicators below ground surface. Soil color was evaluated using *Munsell Soil Color Charts* (Munsell 2000). Soils that exhibited hydric soil indicators, such as low chroma colors and/or evidence of reducing conditions met the hydric soil criterion per USACE (1987 and 2012).

Wetland soils observed during the excavations within the Project Study Limits generally consisted of primarily silt loam texture mineral soils exhibiting reduced, low chroma matrices and documented redox concentrations and/or redox depletions within the matrices. Soil samples within wetland areas most commonly possessed Redox Dark Surface (F6) and/or Depleted Matrix (F3) hydric soil indicator conditions within their profiles. Characteristics

observed at each data point are summarized in the wetland determination data forms included in Appendix A.

4.2.2 Streams Summary

Stream channel reaches delineated within the Project Study Limits included 63 combined perennial, intermittent, and ephemeral channel reaches totaling 11,648 linear feet. Observed stream characteristics are summarized in the stream data forms included in Appendix B. A summary of the streams identified within the Project Study Limits is provided in Table 2: Stream Delineation Summary. The locations of streams delineated onsite are shown on the attached Wetland Delineation Mapping.

4.2.3 Ditches Summary

Jurisdictional ditches delineated within the Project Study Limits included 20 ditch reaches totaling 8,345 linear feet. Classification as a jurisdictional ditch herein is based on the presence of a defined bed and bank, an ordinary high water mark, a direct or indirect connection to a traditional navigable water (TNW), and at least one of the following supplementing attributes:

- Ditches that have relatively permanent flowing or standing water;
- Natural streams that have been altered (e.g. channelized, straightened, or relocated);
- Ditches that have been excavated in jurisdictional waters of the US (WOTUS);
- Ditches that connect two or more jurisdictional WOTUS; and.
- Ditches that drain natural water bodies (including wetlands) into the tributary system of a TNW.

Observed ditch characteristics are summarized in the ditch data forms included in Appendix B. A summary of the jurisdictional ditches identified within the Project Study Limits is provided in Table 3: Ditch Delineation Summary. The locations of jurisdictional ditches delineated onsite are shown on Wetland Delineation Map, Sheets 1 through 101.

4.2.4 Upland Area Summary

During the field investigation of the Project Study Limits, significant areas of upland or non-jurisdictional areas were identified. The majority of the identified upland areas are characterized by mixed deciduous forest and active agricultural lands, including row crops, forage hay production, and active pasture. Upland soils observed were primarily silt loam texture exhibiting medium to high chroma 2.5Y and 10YR matrices throughout the soil profile to a depth of twenty inches below ground surface. Typically, no indicators of wetland hydrology were observed within the upland areas. The location and size of upland areas in addition to the mapped soils present at these locations are depicted on the attached Wetland Delineation Mapping.

5.0 SUMMARY AND CONCLUSIONS

Fisher Associates conducted a wetland delineation associated with the Project between conducted a field delineation between October 26 to November 20, 2015 and May 19 to July 8, 2016. 66.60-acres of combined PEM, PSS, and PFO wetlands were identified. In addition,

11,648 linear feet of combined perennial, intermittent, and ephemeral stream channel reaches and 8,345 linear feet of jurisdictional ditches were identified within the Project Study Limits.

Based on conditions observed, the USACE will likely invoke jurisdiction over all identified wetlands, stream reaches, and jurisdictional ditches due to their apparent hydrologic connection to other waters. It is also anticipated that the NYSDEC will invoke jurisdiction over the delineated wetlands under Article 24 of the Environmental Conservation Law (ECL) that are associated with NYSDEC Wetlands SC-12 (delineated wetlands A593 and A594) and SC-13 (delineated wetlands A643 and A644). It is not anticipated that the NYSDEC will invoke jurisdiction over the additional wetland systems identified as they are not within close proximity (i.e., less than 50 meters) of Wetlands SC-12, SC-13, or other mapped NYSDEC wetlands and their regulated 100-foot adjacent areas. NYSDEC will likely invoke jurisdiction over 17 of the 63 stream reaches delineated within the Project Study Limits under Article 15 of the ECL, as they are recognized as Class A streams. NYSDEC is not anticipated to invoke jurisdiction over the remaining 46 stream reaches or jurisdictional ditches identified under Article 15 of the ECL, as they are recognized as either Class C or D streams.

6.0 REFERENCES

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

Department of the Army, Corps of Engineers, and Environmental Protection Agency, "Clean Water Rule: Definition of 'Waters of the United States,' Final Rule," 80 *Federal Register* 37054-37127, June 29, 2015.

Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2014. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual.* Technical Report Y-87-1. U.S. Army Corps of Engineers: Waterways Experiment Station; Vicksburg, MS.

Environmental Laboratory. 2012. *U.S. Army Corps of Engineers Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*. U.S. Army Engineer Research and Development Center.

Kollmorgen Corporation. 2000. *Munsell Soil Color Charts.* Macbeth Division of Kollmorgen Corporation, Baltimore, MD.

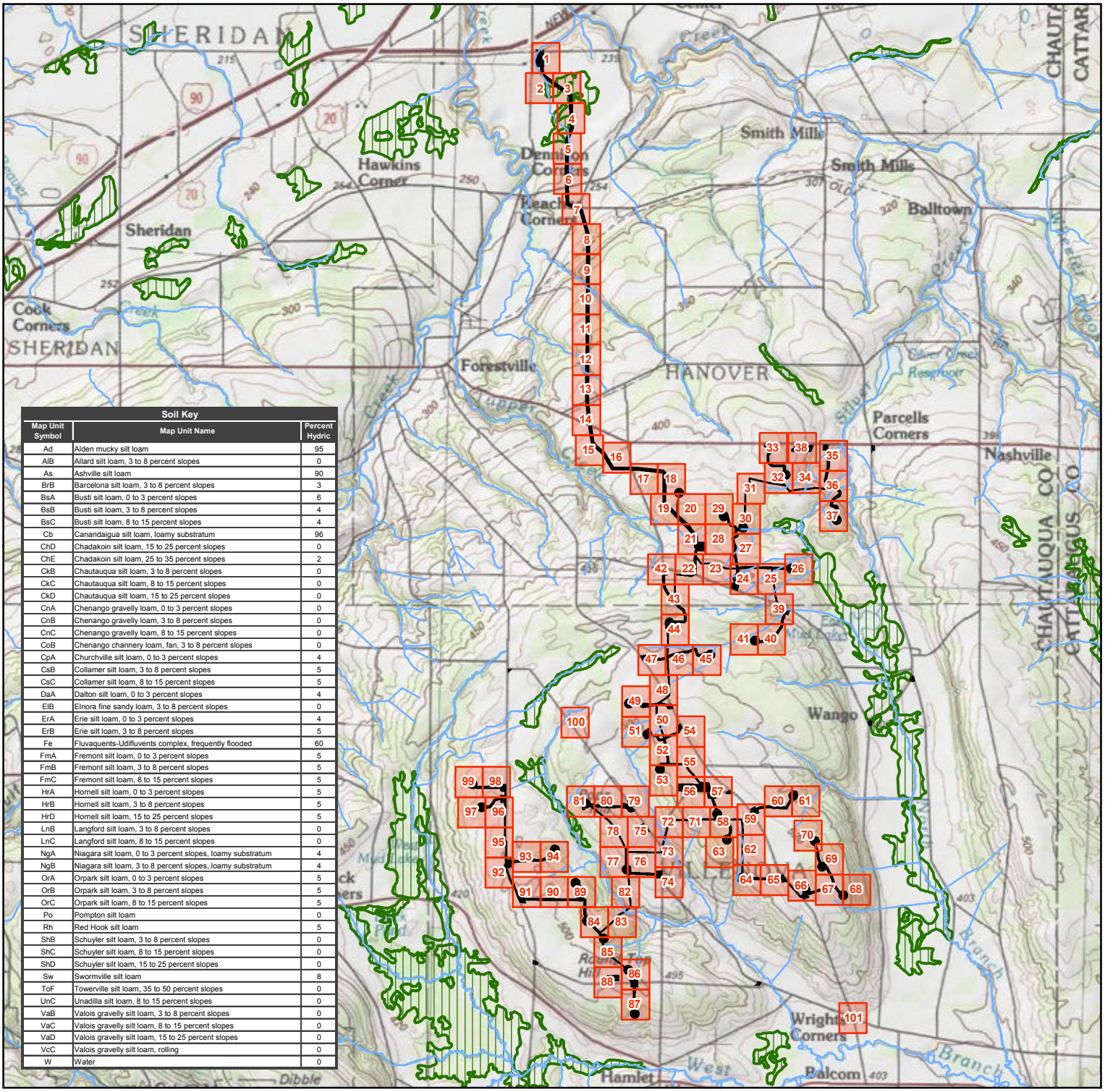
Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List:* 2016 Update of wetland ratings. Phytoneuron 2016-30: 1-17. Available at: http://wetland plants.usace.army.mil/

New York State Department of Environmental Conservation (NYSDEC). 2015. Environmental Resource Mapper. http://www.dec.ny.gov/animals/38801.html

USDA-NRCS. 2015. *Web Soil Survey*. Natural Resource Conservation Service. U.S. Department of Agriculture. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

U.S. Fish & Wildlife Service (USFWS). 2015. National Wetland Inventory. http://www.fws.gov/wetlands

MAPS



Soil Key

Map Unit Symbol	Map Unit Name	Percent Hydric
Ad	Alden mucky silt loam	95
AlB	Allard silt loam, 3 to 8 percent slopes	0
As	Ashville silt loam	90
BrB	Barcelona silt loam, 3 to 8 percent slopes	3
BsA	Busti silt loam, 0 to 3 percent slopes	6
BsB	Busti silt loam, 3 to 8 percent slopes	4
BsC	Busti silt loam, 8 to 15 percent slopes	4
Cb	Canandaigua silt loam, loamy substratum	96
ChD	Chadakoin silt loam, 15 to 25 percent slopes	0
ChE	Chadakoin silt loam, 25 to 35 percent slopes	2
CkB	Chautauqua silt loam, 3 to 8 percent slopes	0
CkC	Chautauqua silt loam, 8 to 15 percent slopes	0
CkD	Chautauqua silt loam, 15 to 25 percent slopes	0
CnA	Chenango gravelly loam, 0 to 3 percent slopes	0
CnB	Chenango gravelly loam, 3 to 8 percent slopes	0
CnC	Chenango gravelly loam, 8 to 15 percent slopes	0
CoB	Chenango channery loam, fan, 3 to 8 percent slopes	0
CpA	Churchville silt loam, 0 to 3 percent slopes	4
CsB	Collamer silt loam, 3 to 8 percent slopes	5
CsC	Collamer silt loam, 8 to 15 percent slopes	5
DaA	Dalton silt loam, 0 to 3 percent slopes	4
ElB	Elnora fine sandy loam, 3 to 8 percent slopes	0
ErA	Erie silt loam, 0 to 3 percent slopes	4
ErB	Erie silt loam, 3 to 8 percent slopes	5
Fe	Fluvaquents-Udifluvents complex, frequently flooded	60
FmA	Fremont silt loam, 0 to 3 percent slopes	5
FmB	Fremont silt loam, 3 to 8 percent slopes	5
FmC	Fremont silt loam, 8 to 15 percent slopes	5
HrA	Hornell silt loam, 0 to 3 percent slopes	5
HrB	Hornell silt loam, 3 to 8 percent slopes	5
HrD	Hornell silt loam, 15 to 25 percent slopes	5
LnB	Langford silt loam, 3 to 8 percent slopes	0
LnC	Langford silt loam, 8 to 15 percent slopes	0
NgA	Niagara silt loam, 0 to 3 percent slopes, loamy substratum	4
NgB	Niagara silt loam, 3 to 8 percent slopes, loamy substratum	4
OrA	Orpark silt loam, 0 to 3 percent slopes	5
OrB	Orpark silt loam, 3 to 8 percent slopes	5
OrC	Orpark silt loam, 8 to 15 percent slopes	5
Po	Pompton silt loam	0
Rh	Red Hook silt loam	5
ShB	Schuyler silt loam, 3 to 8 percent slopes	0
ShC	Schuyler silt loam, 8 to 15 percent slopes	0
ShD	Schuyler silt loam, 15 to 25 percent slopes	0
Sw	Swormville silt loam	8
ToF	Towerville silt loam, 35 to 50 percent slopes	0
UnC	Unadilla silt loam, 8 to 15 percent slopes	0
VaB	Valois gravelly silt loam, 3 to 8 percent slopes	0
VaC	Valois gravelly silt loam, 8 to 15 percent slopes	0
VaD	Valois gravelly silt loam, 15 to 25 percent slopes	0
VcC	Valois gravelly silt loam, rolling	0
W	Water	0

Project USGS Quad(s):

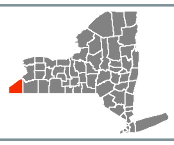
Silver Creek, Forestville, Perrysburg

Project Watershed(s):

Chautauqua-Conneaut (HUC 04120101)
Conewangot (HUC 05010002)

Project Study Limits:
665.38 Acres

Center of Project Study Limits:
42.440 N, -79.128 W
North American Datum 1983



NYSDEC Stream (Class, Standard)
Project Study Limits
NYSDEC Freshwater Wetland
Mapsheet

Data Sources:

United States Geological Survey 24k Topo Quad Map - usgs.gov
Aerial Photography: NYS GIS Clearinghouse (2012): nysgis.state.ny.us
Roads: NYS GIS Clearinghouse (9/30/2015): nysgis.state.ny.us
Streams: NYSDEC (10/19/2015) - dec.ny.gov
Wetlands: NYSDEC (8/18/2014) - dec.ny.gov
Wetlands: National Wetland Inventory (5/1/2014) - fws.gov/wetlands/
Soils: NRCS Soil Survey (10/7/2015) - gdg.sc.egov.usda.gov

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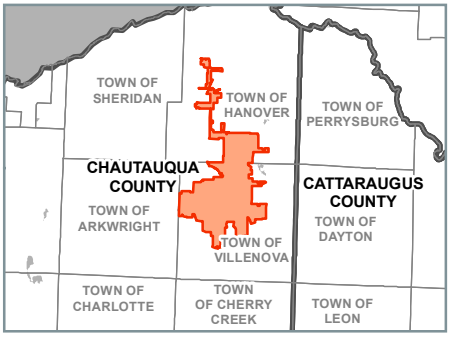

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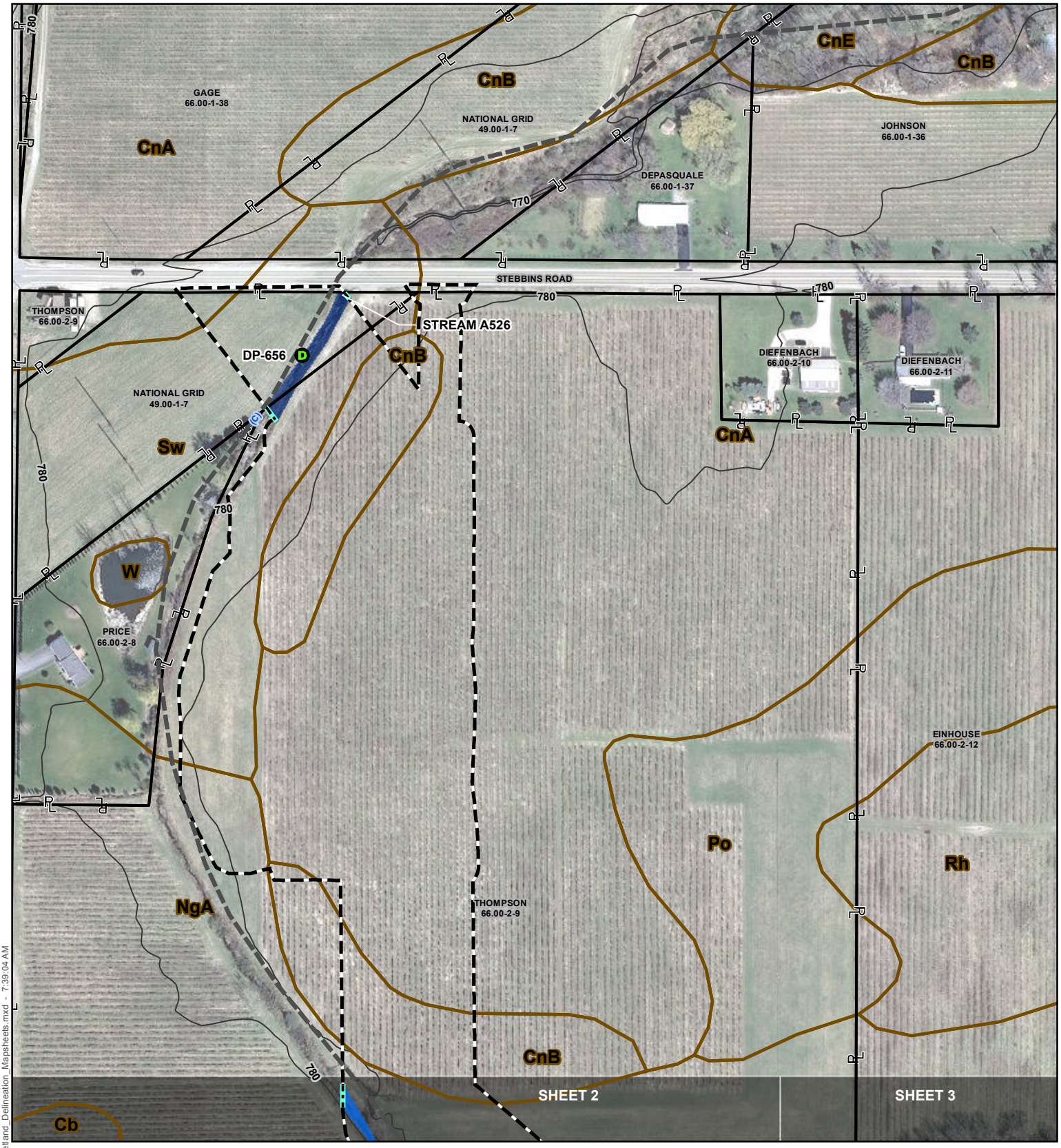

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Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

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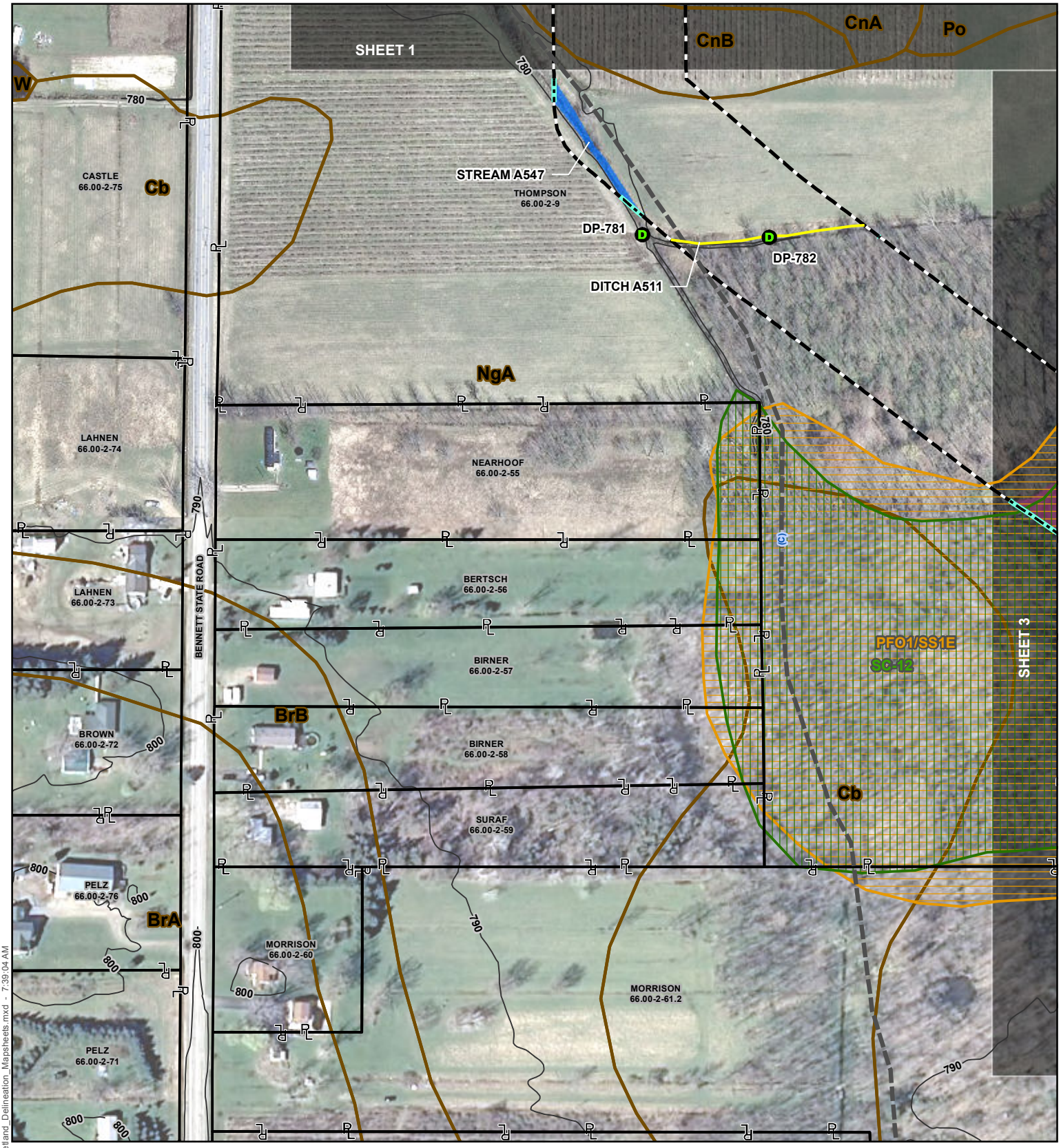

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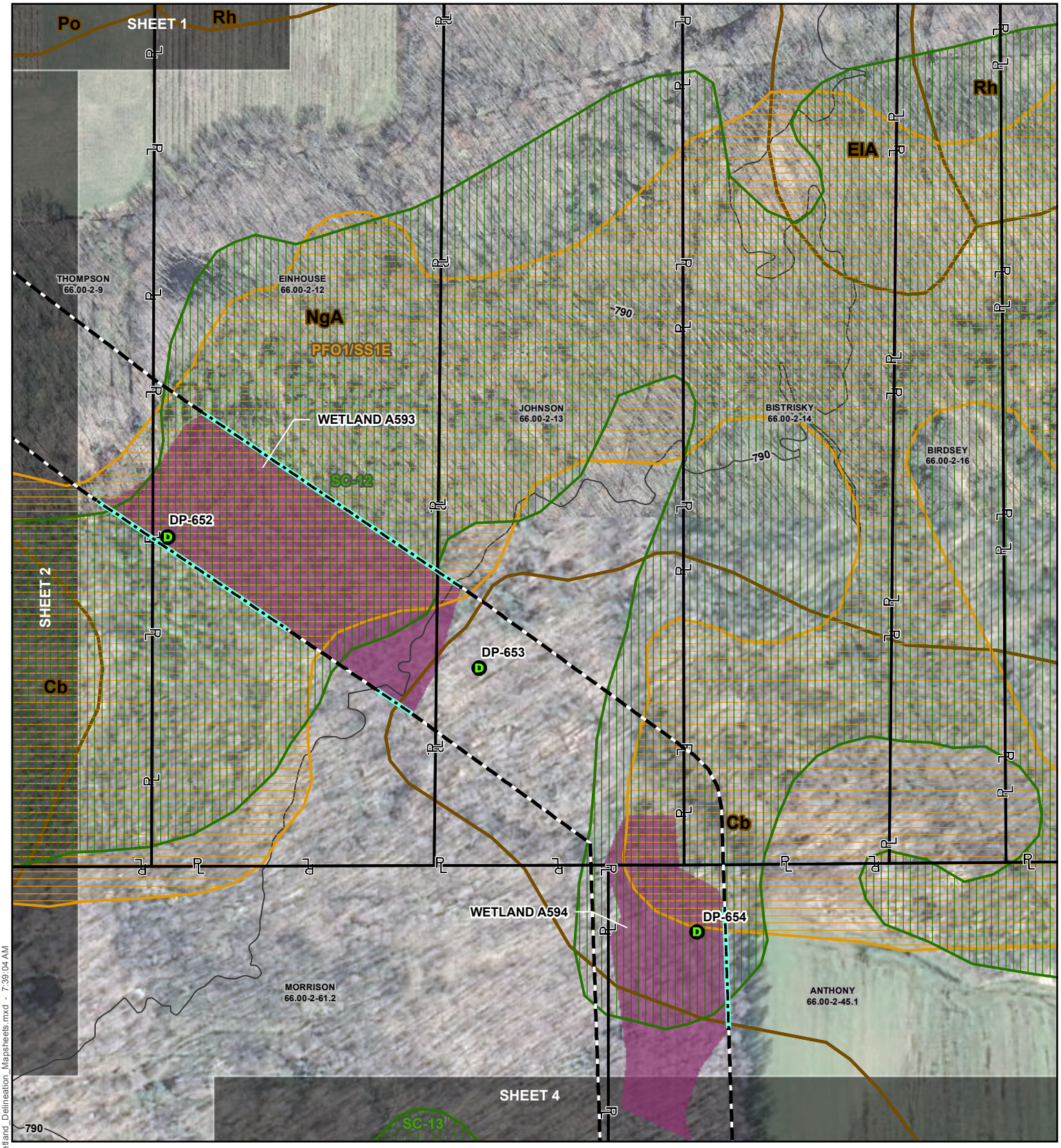

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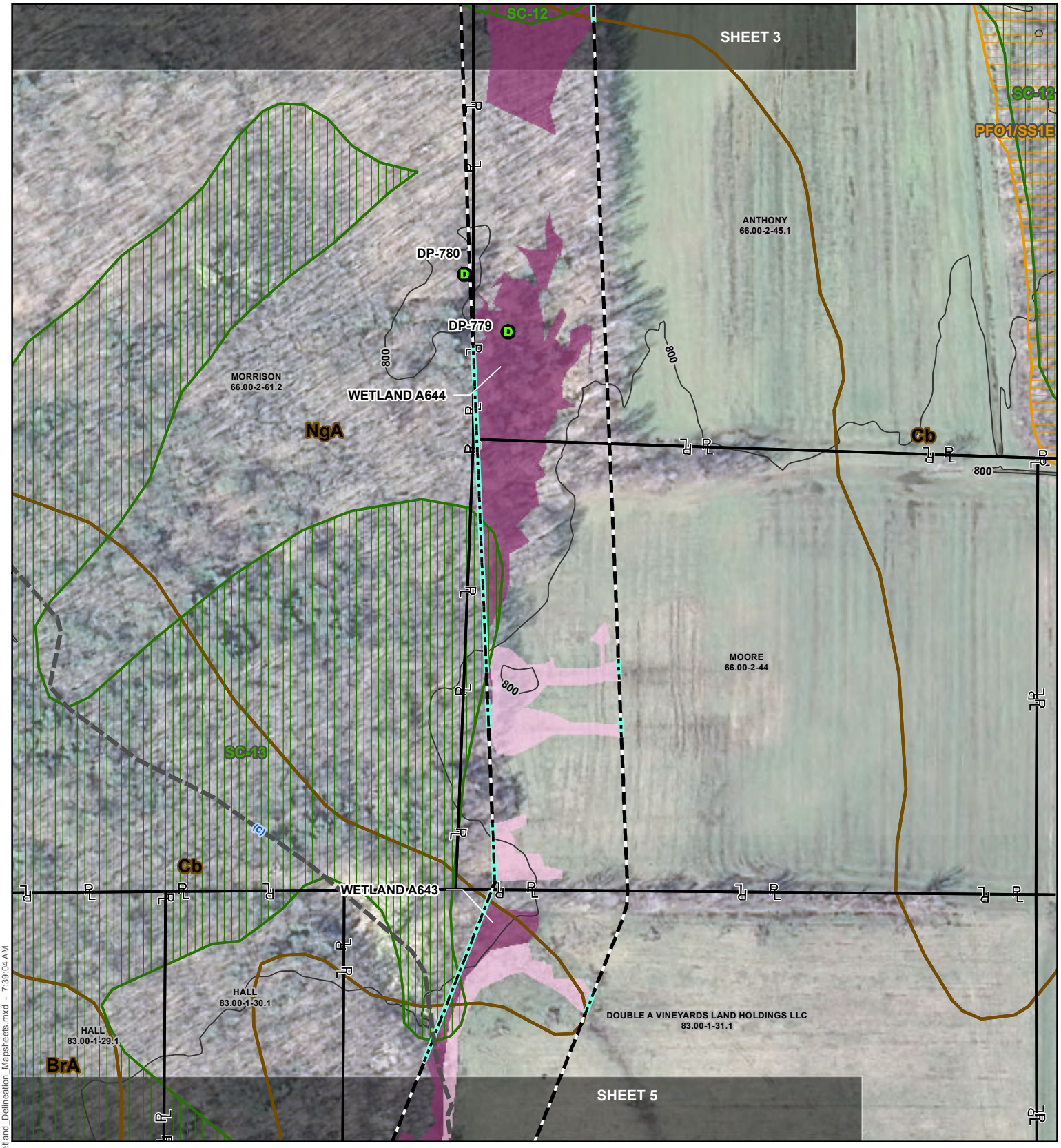

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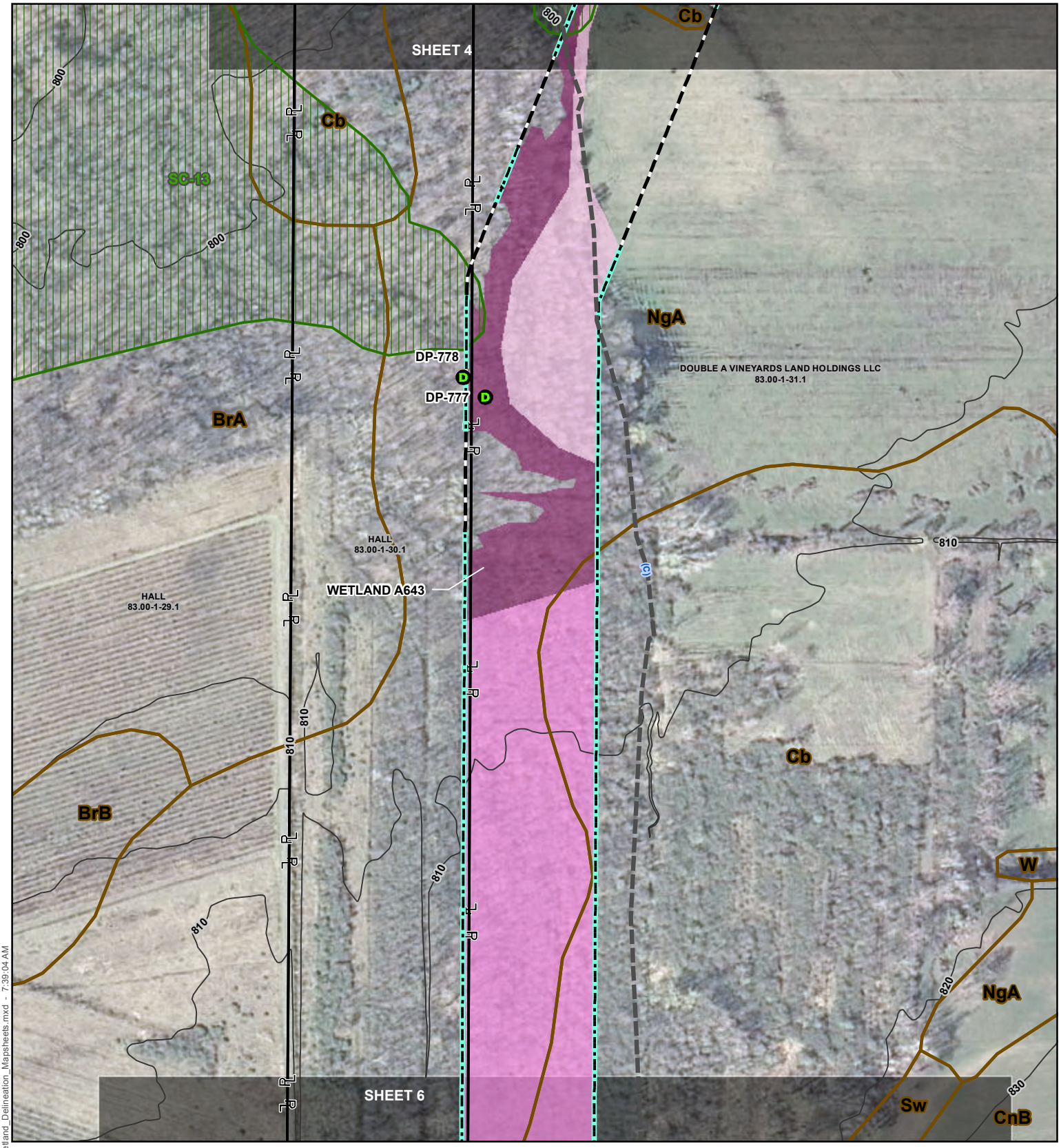

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NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
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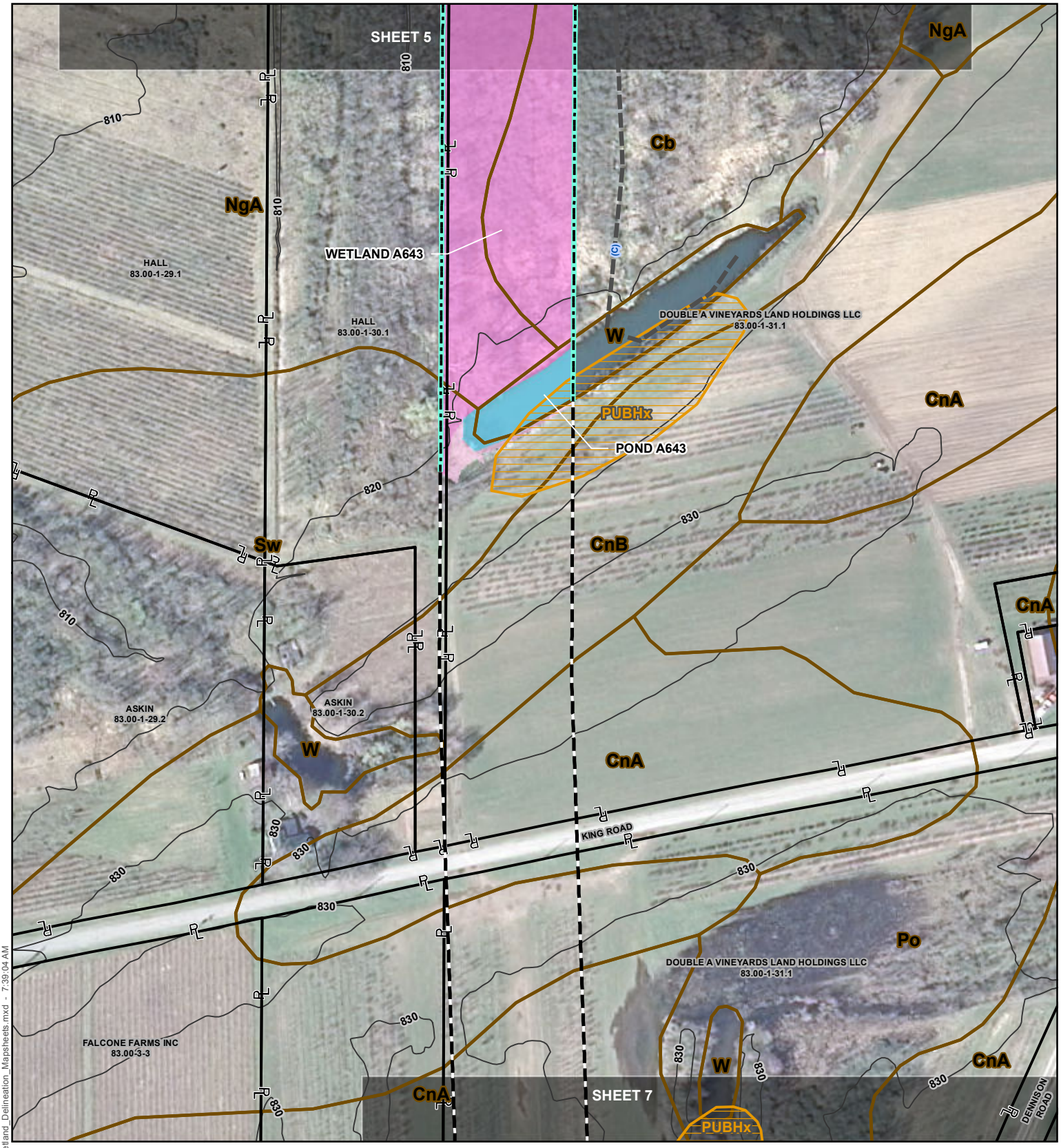

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Delineated PSS Wetland
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NYSDEC Freshwater Wetland
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Matchline

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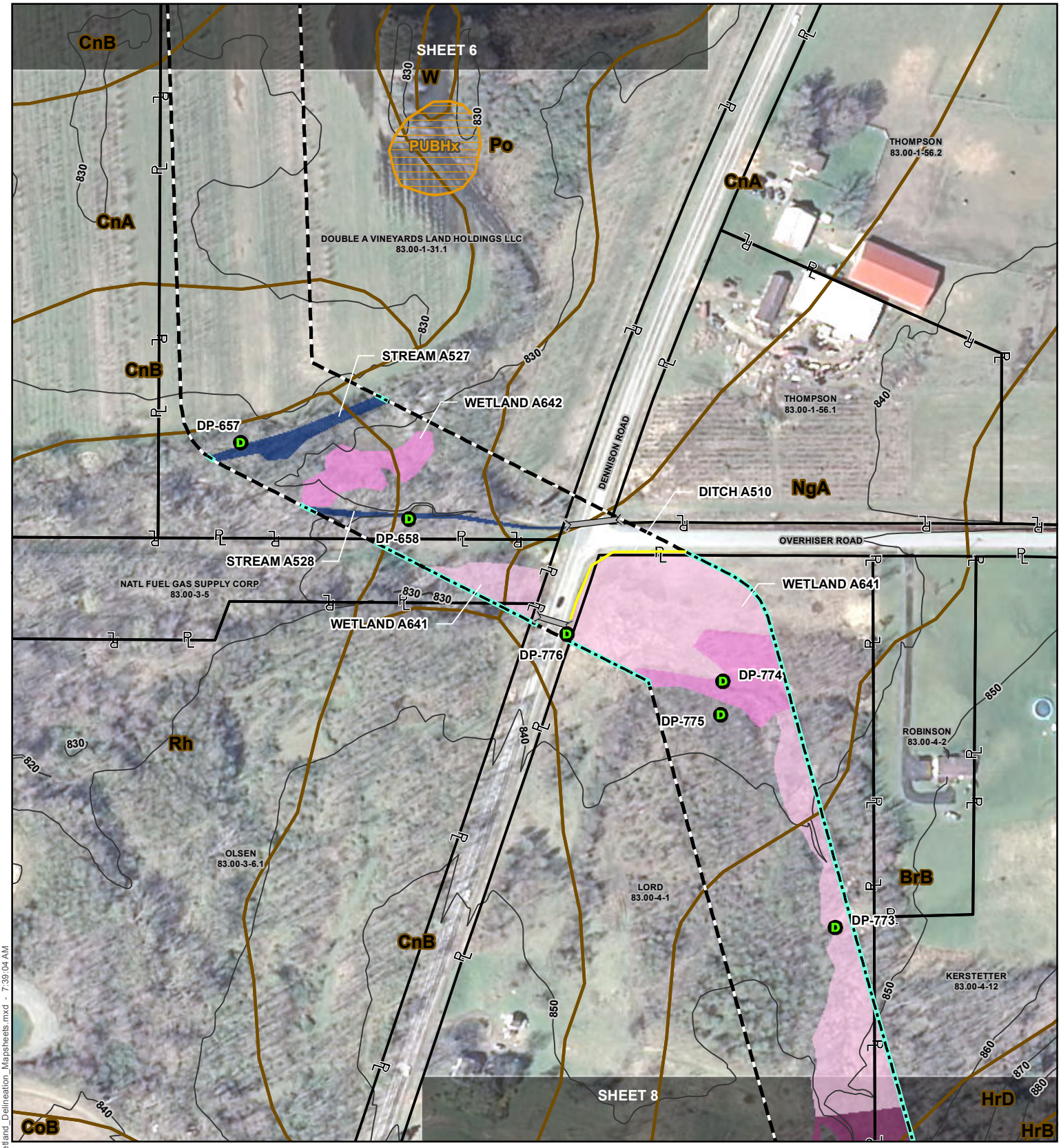

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Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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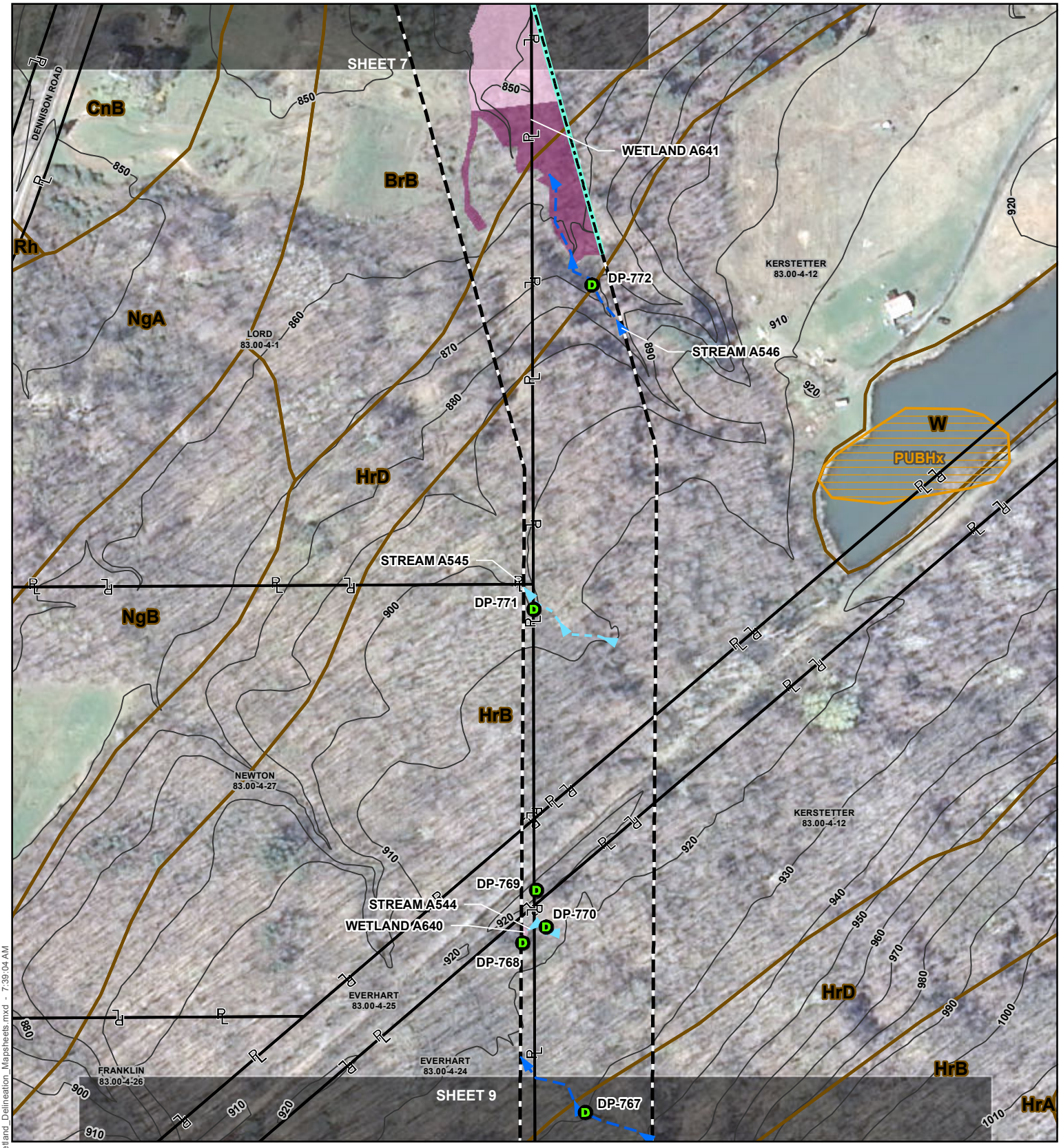

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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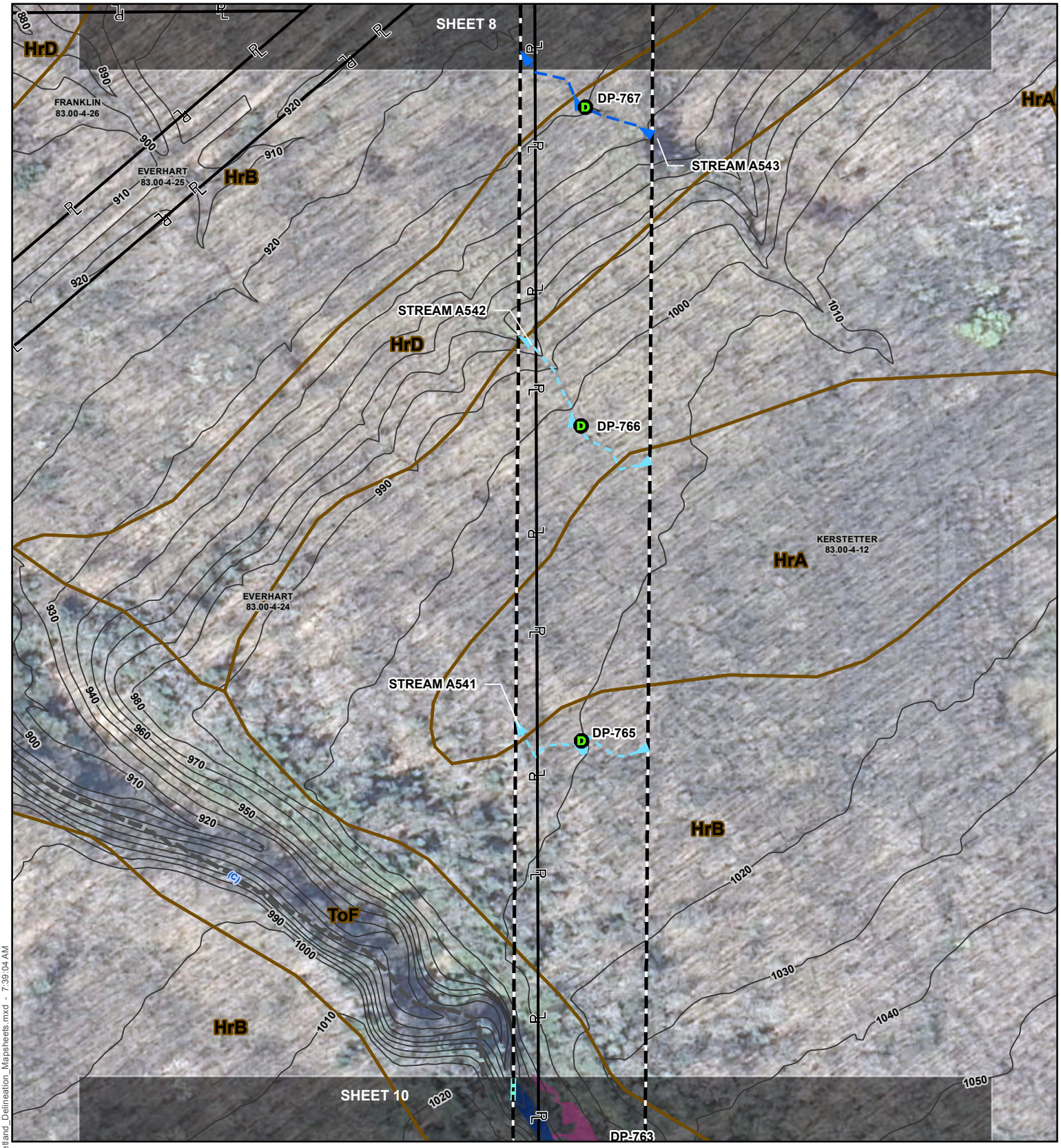

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
Contours (10ft)
Delineated Intermittent Stream
Delineated Perennial Stream
Delineated Pond
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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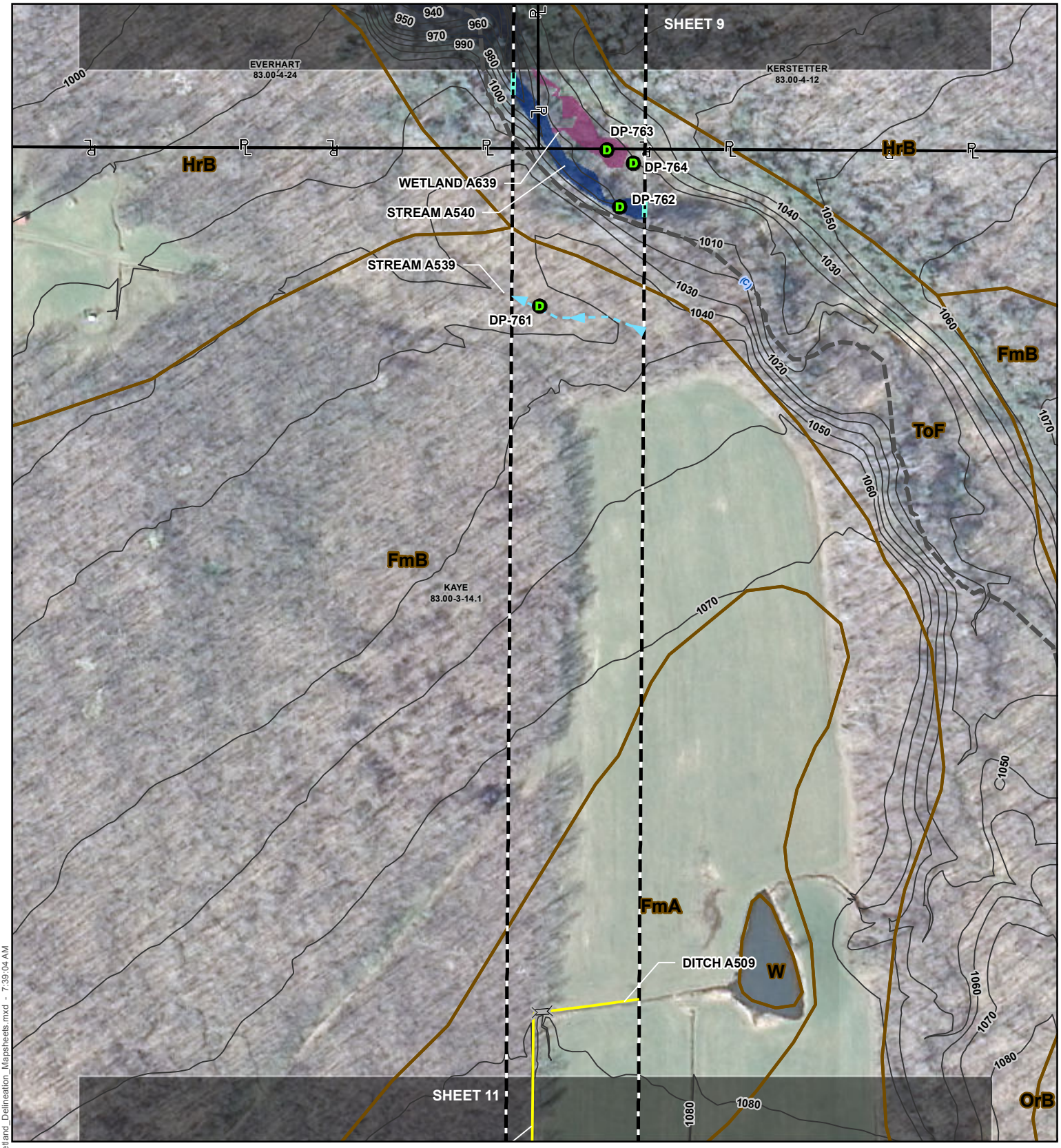

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
Contours (10ft)
Delineated Intermittent Stream
Delineated Perennial Stream
Delineated Pond
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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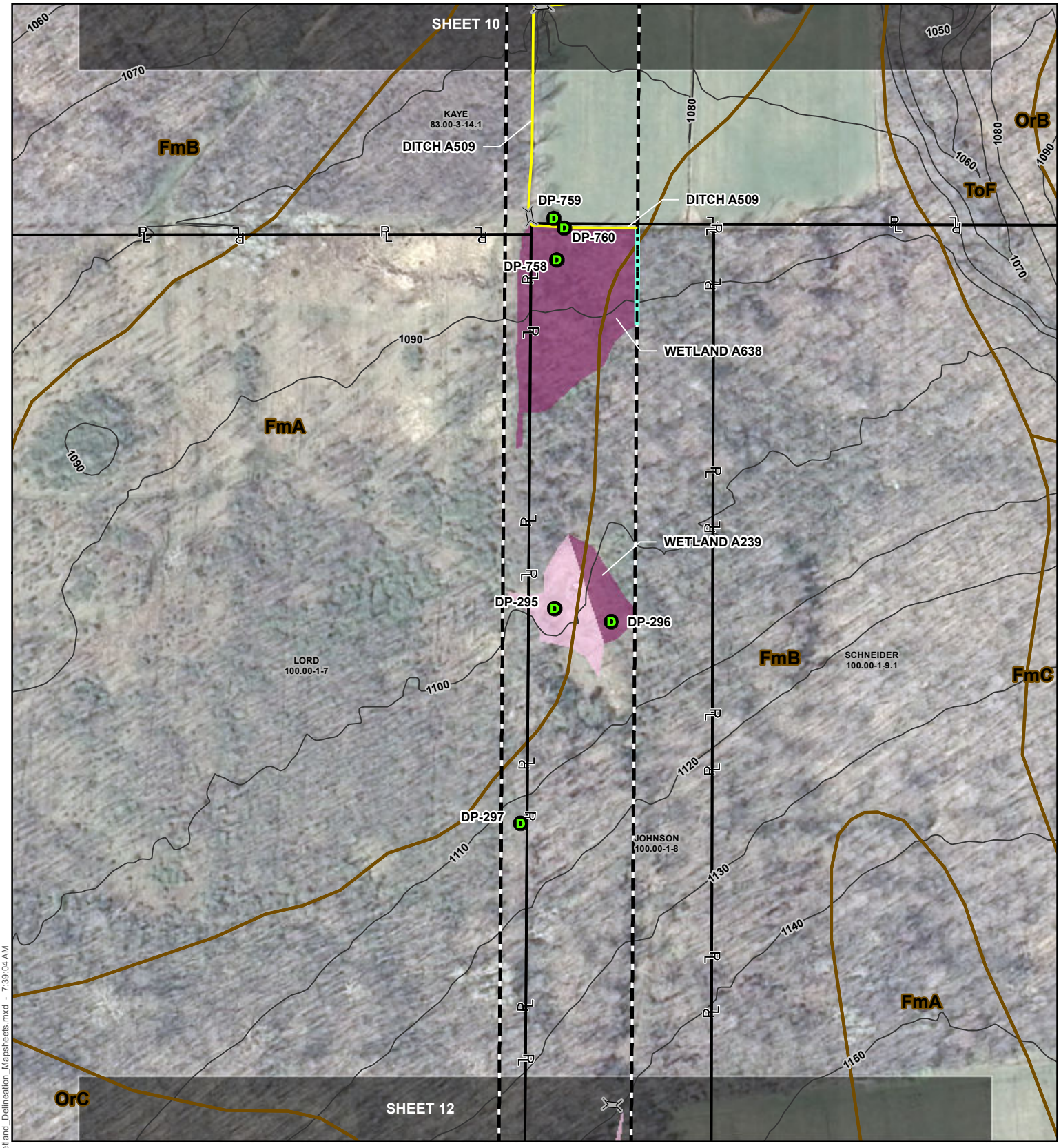

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
- NYSDEC Stream (Standard)
- Contours (10ft)
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Delineated Pond
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- NWI Wetland
- NYSDEC Freshwater Wetland
- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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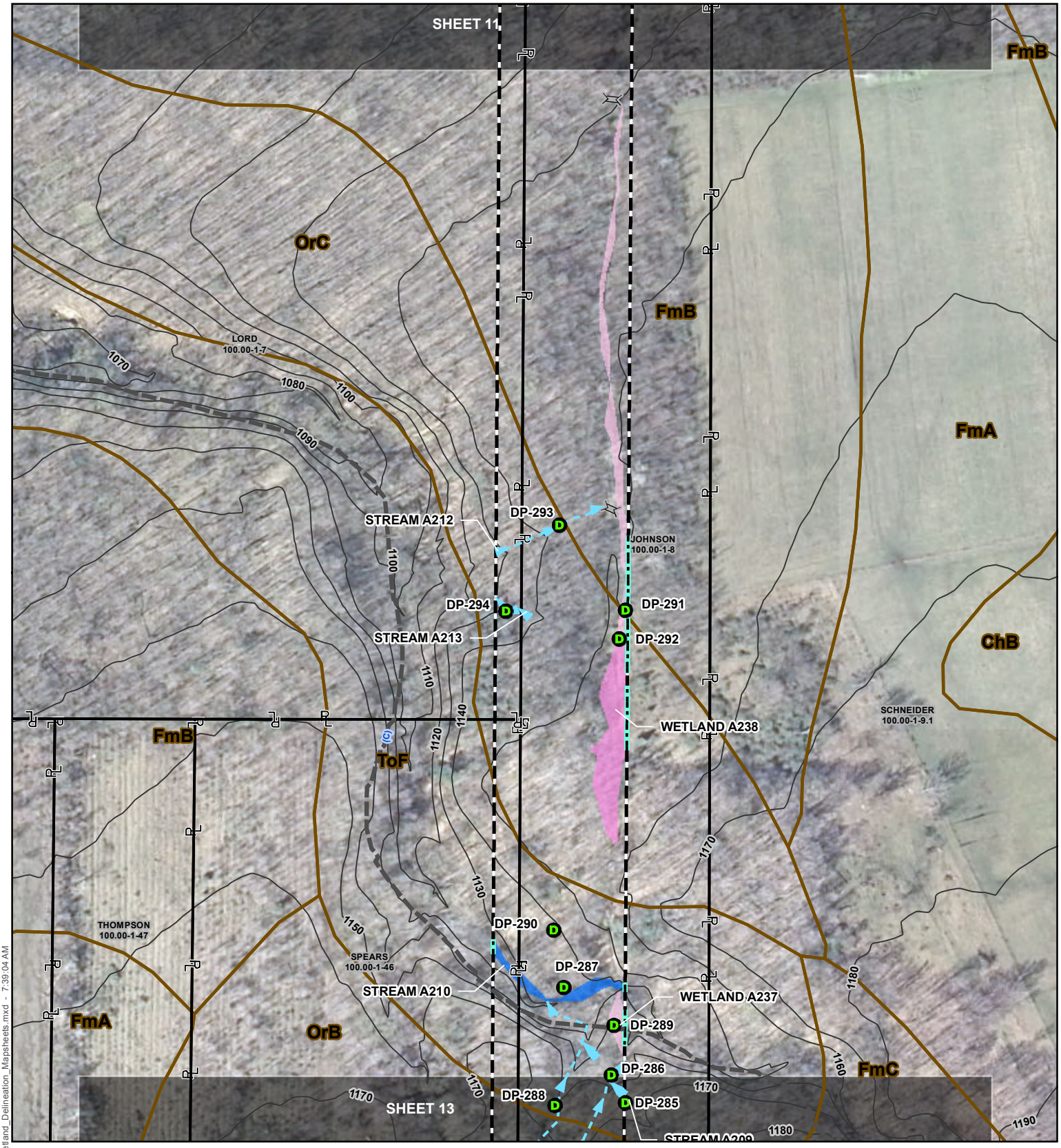

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Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
- NYSDEC Stream (Standard)
- Contours (10ft)
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Delineated Pond
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- NWI Wetland
- NYSDEC Freshwater Wetland
- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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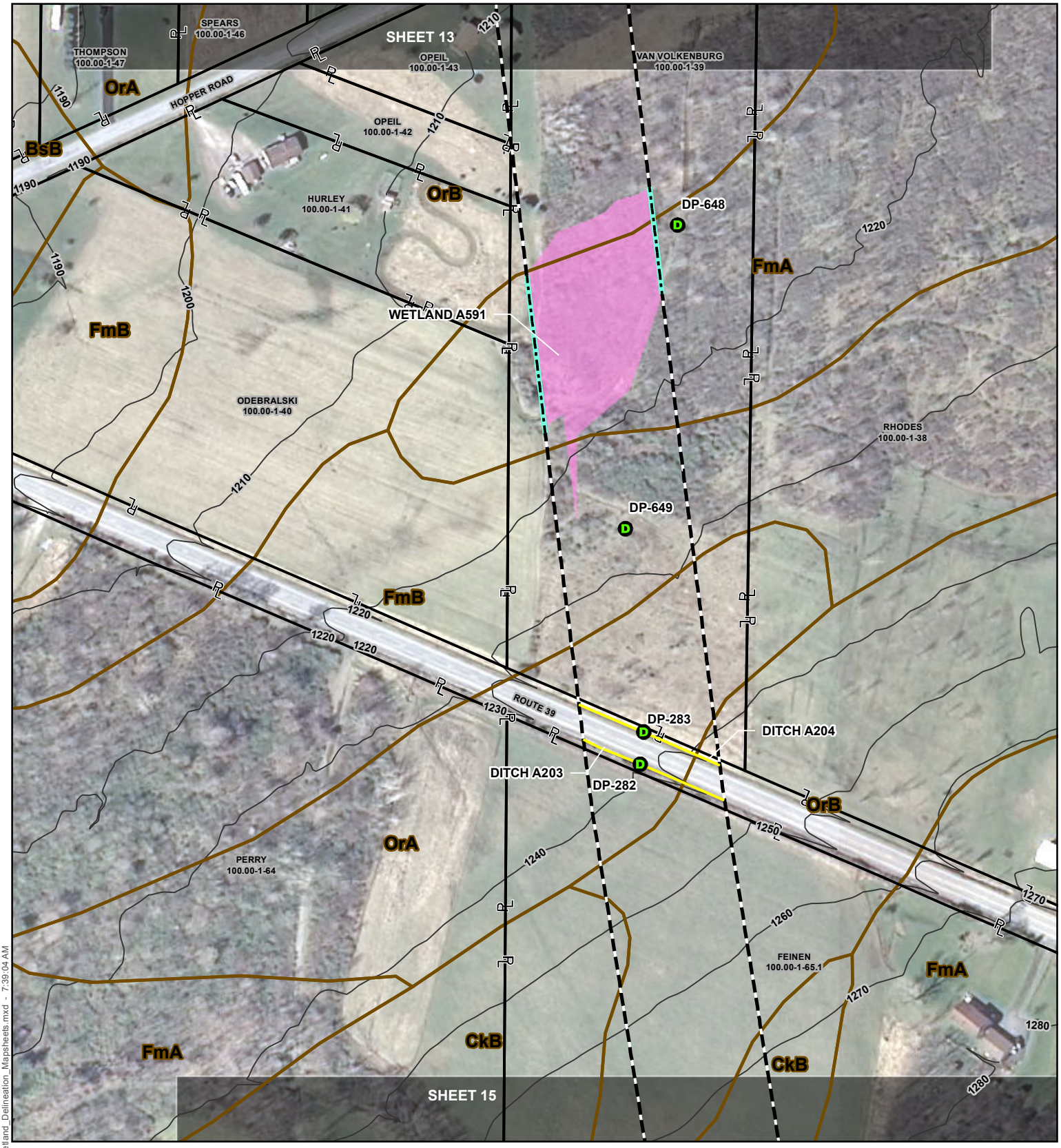

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
Contours (10ft)
Delineated Intermittent Stream
Delineated Perennial Stream
Delineated Pond
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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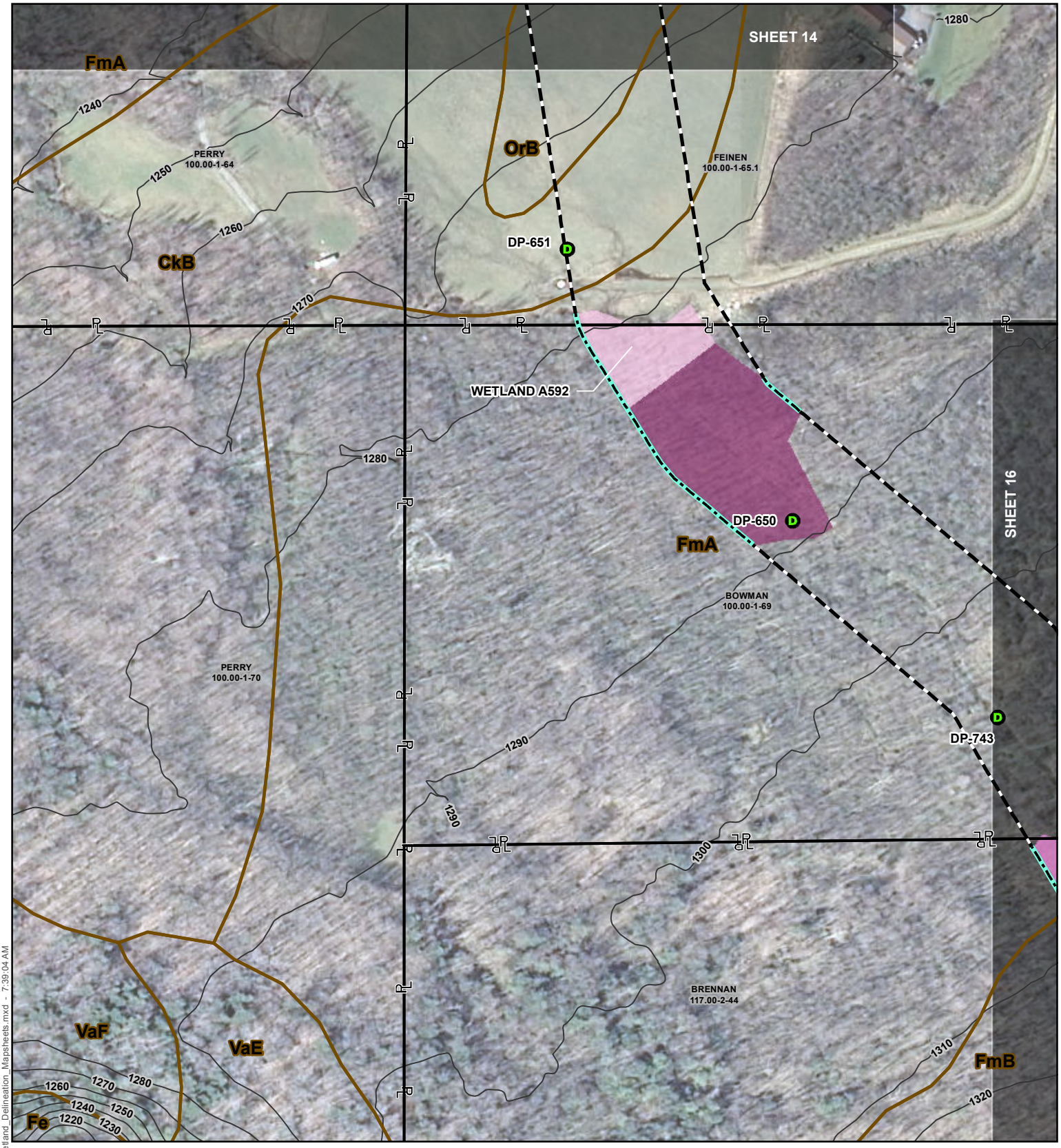

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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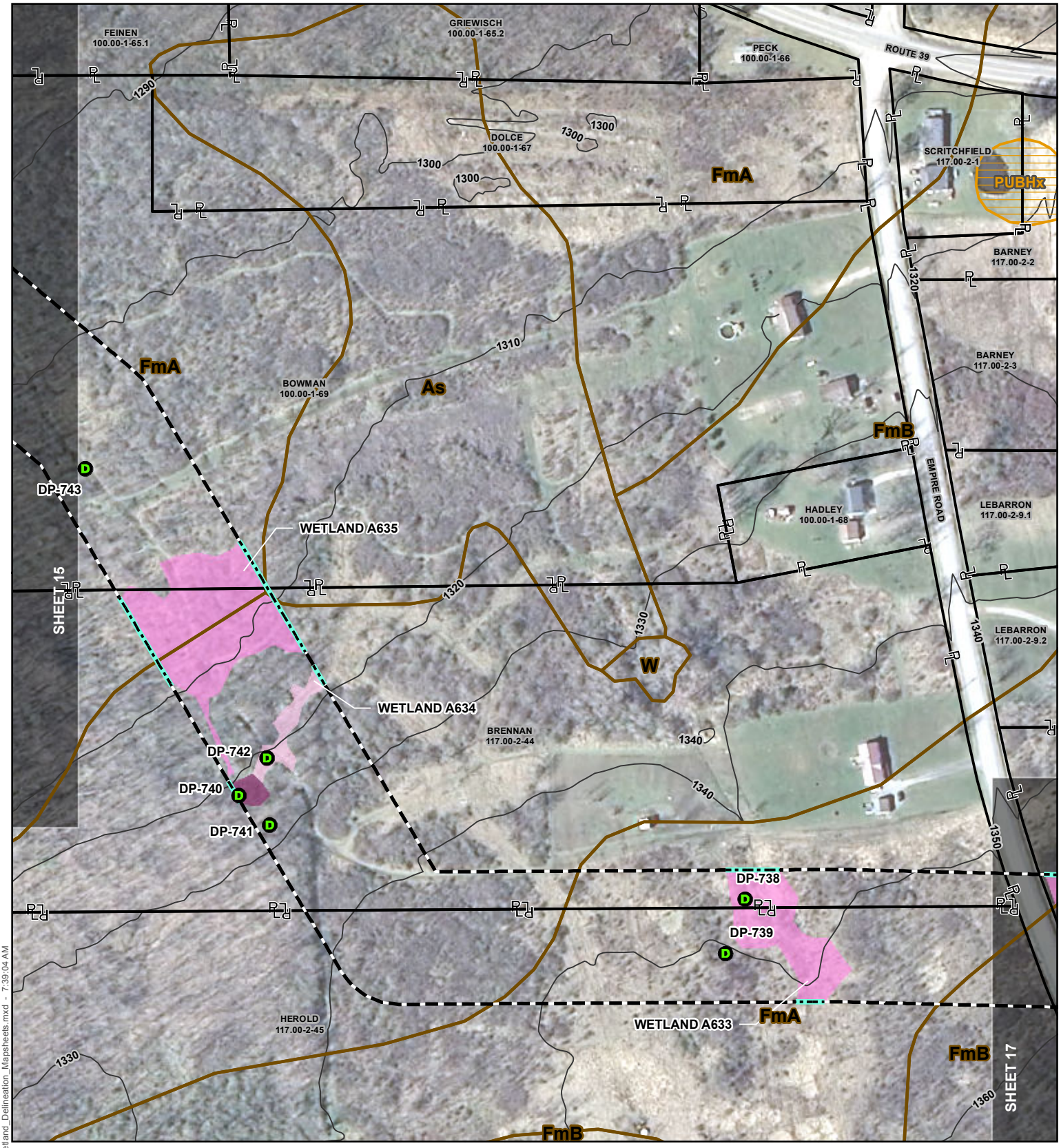

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
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Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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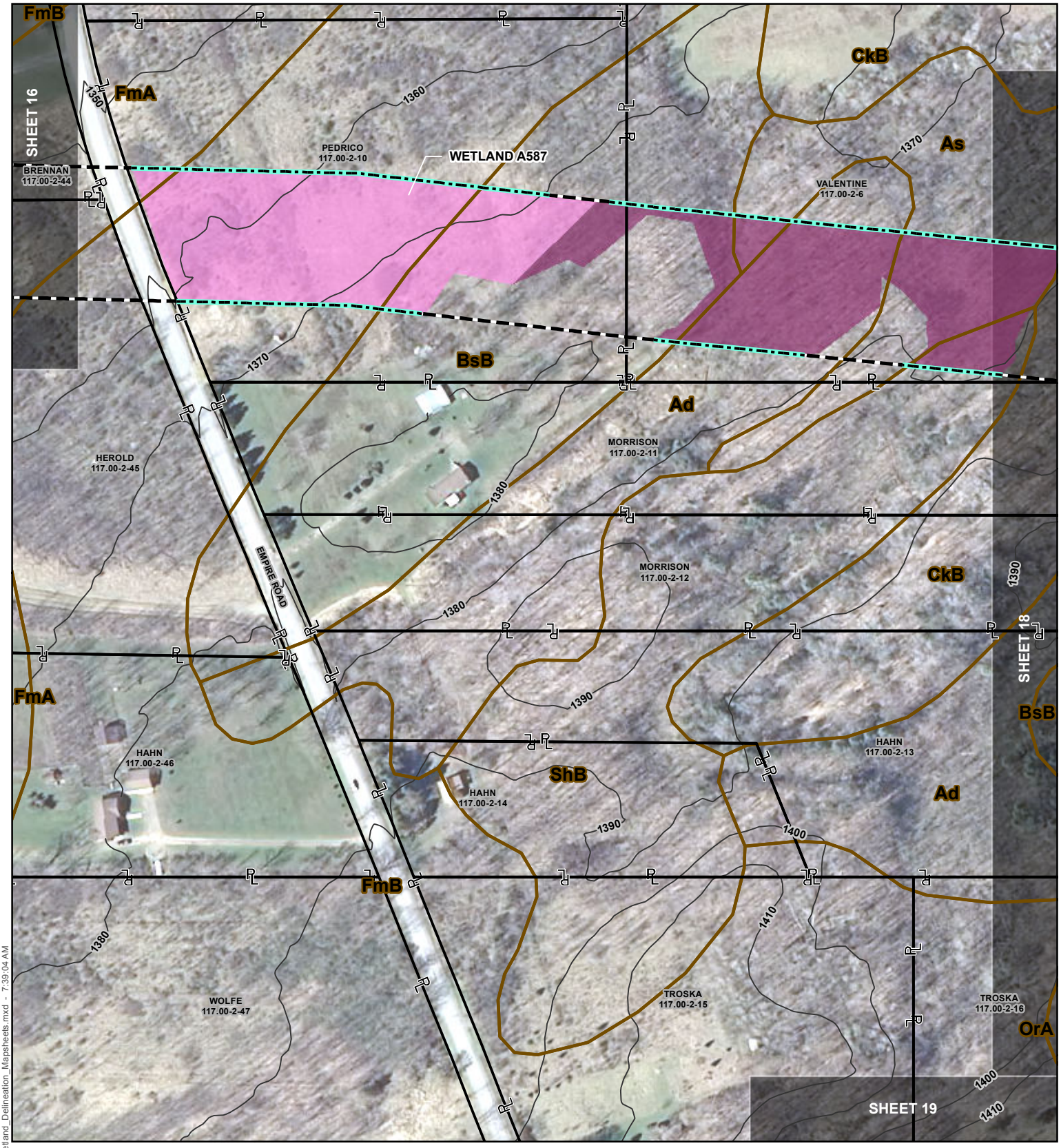

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
- NYSDEC Stream (Standard)
- Contours (10ft)
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Delineated Pond
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- NWI Wetland
- NYSDEC Freshwater Wetland
- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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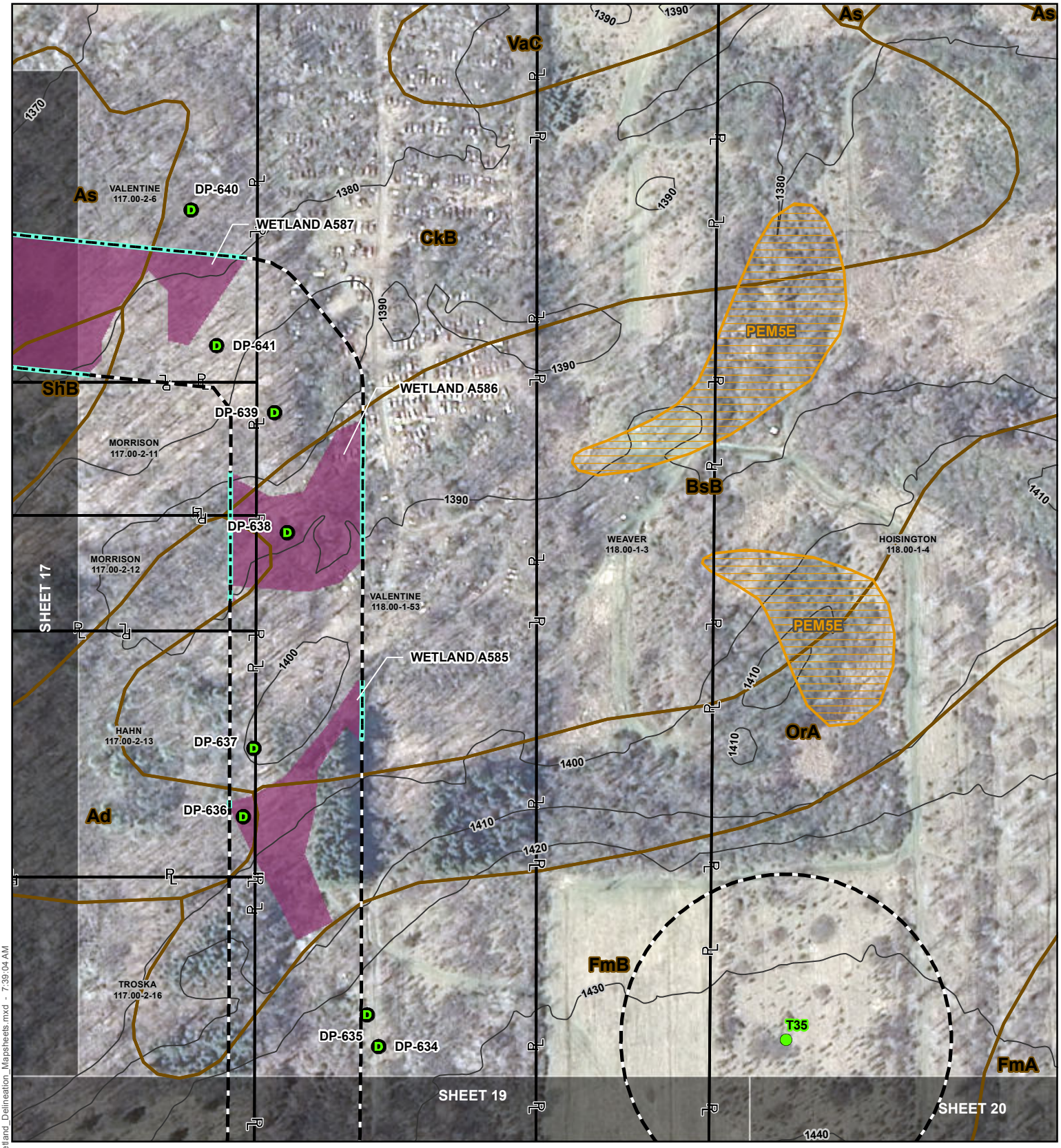

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
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- Delineated PSS Wetland
- NWI Wetland
- NYSDEC Freshwater Wetland
- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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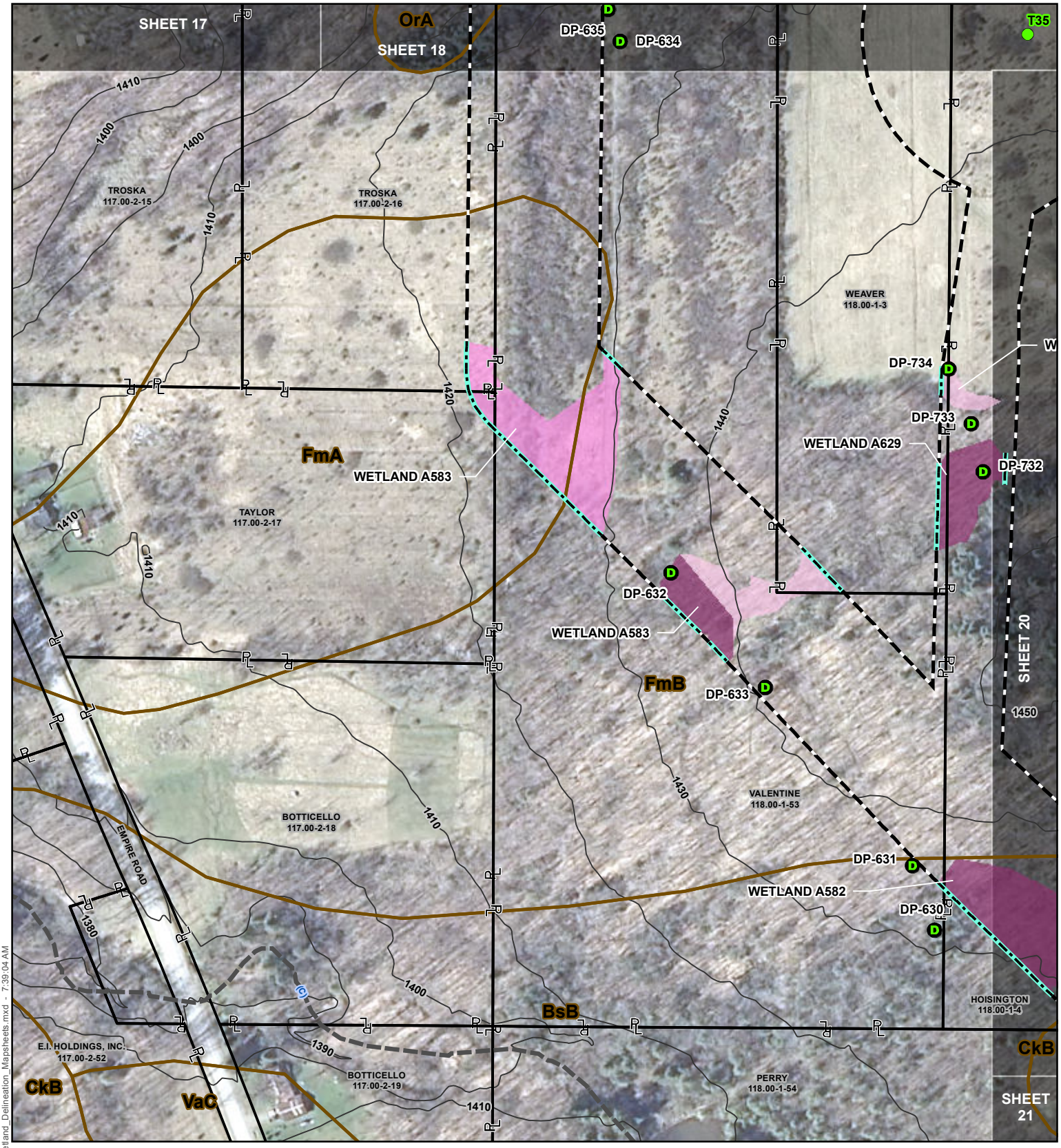

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
Contours (10ft)
Delineated Intermittent Stream
Delineated Perennial Stream
Delineated Pond
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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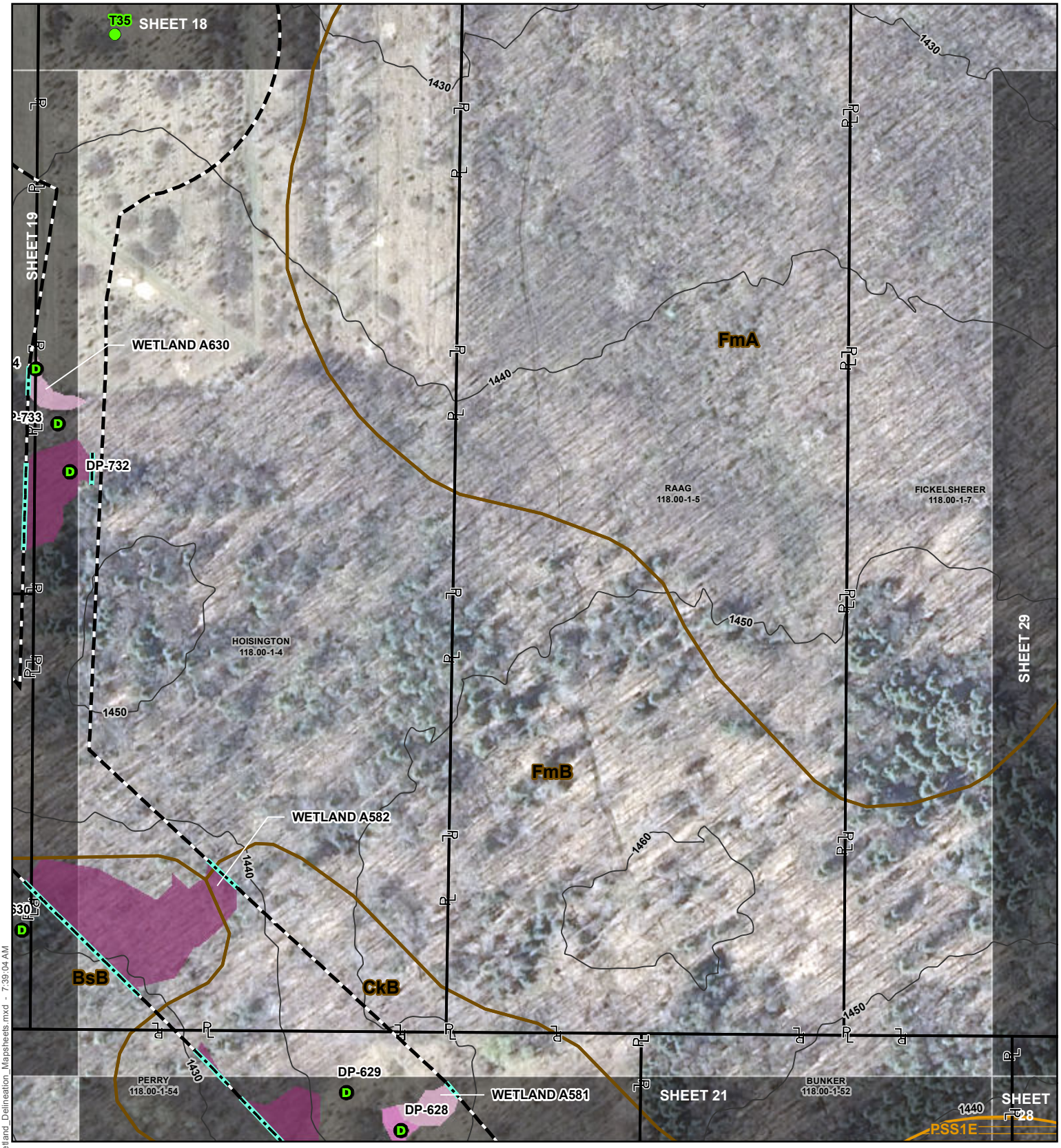

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
- NYSDEC Stream (Standard)
- Contours (10ft)
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Delineated Pond
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- NWI Wetland
- NYSDEC Freshwater Wetland
- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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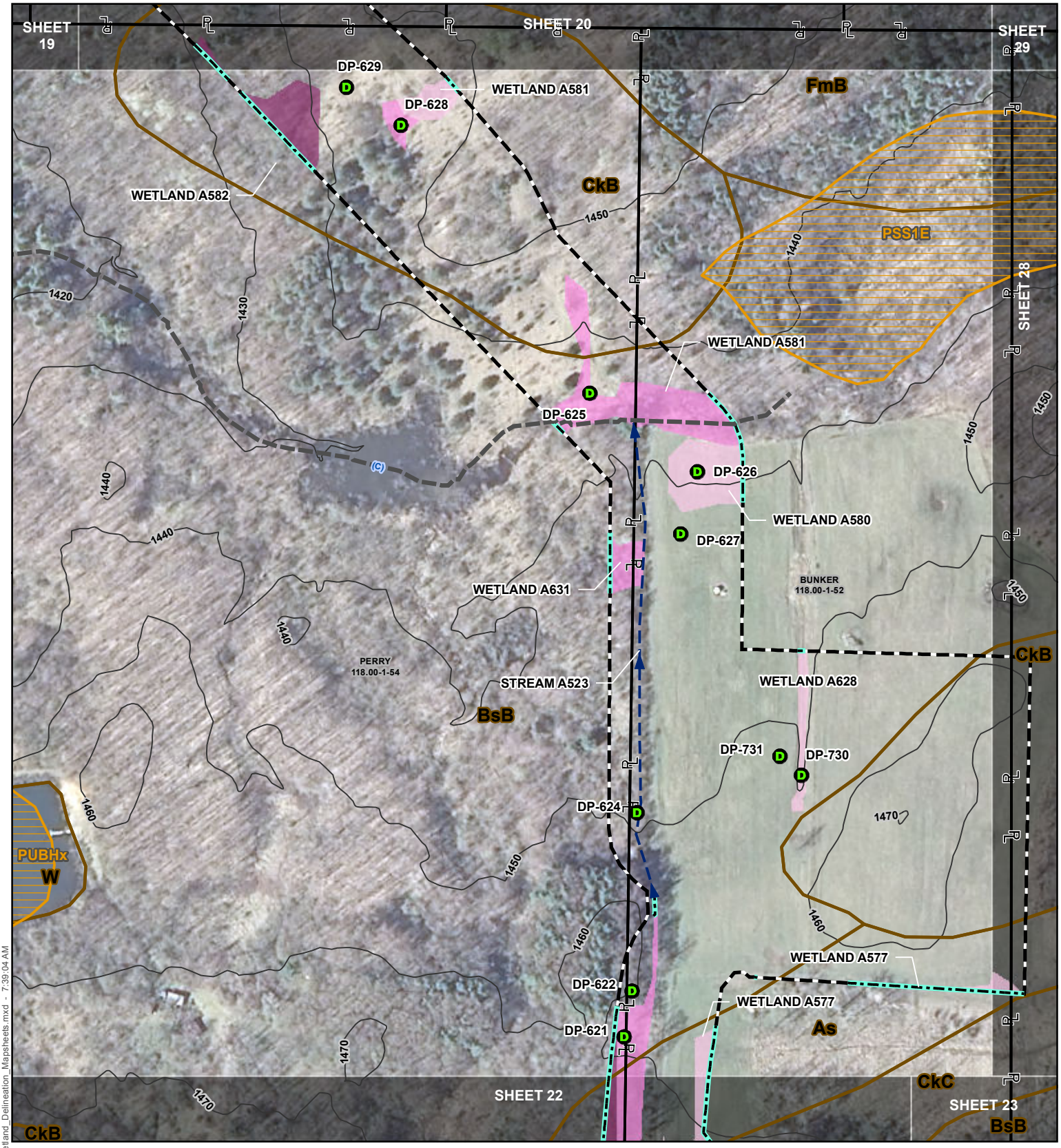

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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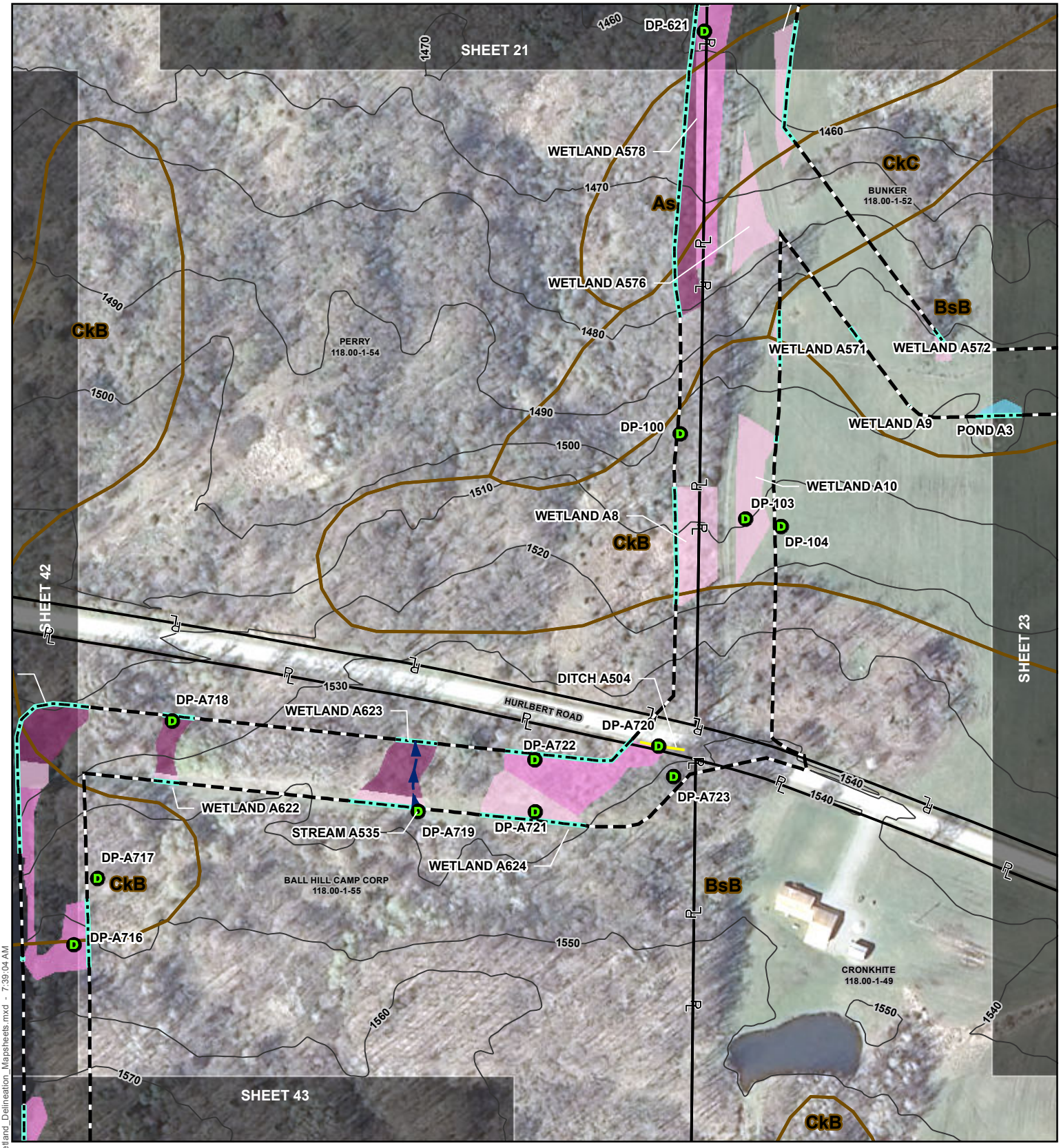

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
Contours (10ft)
Delineated Intermittent Stream
Delineated Perennial Stream
Delineated Pond
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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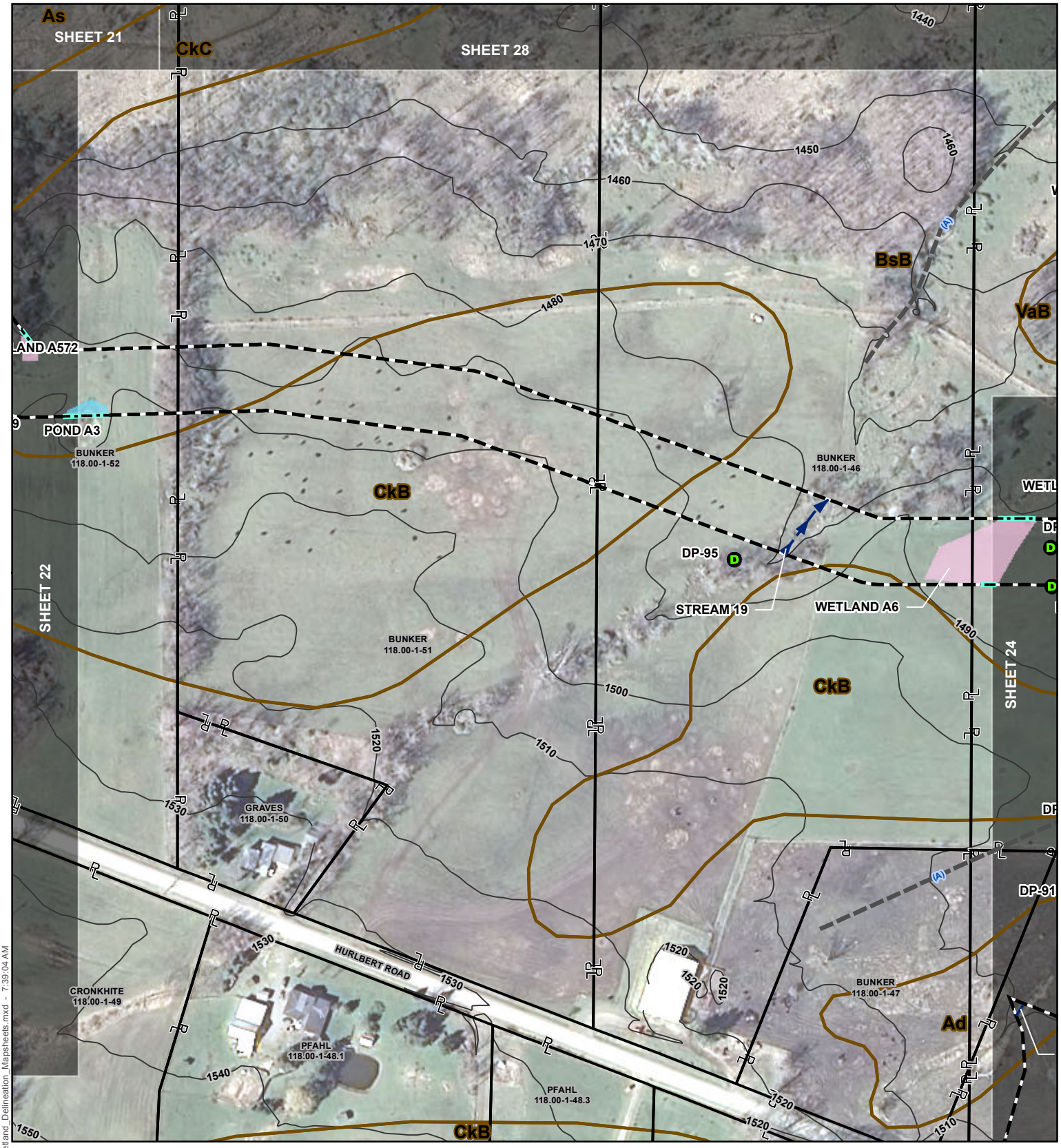

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
- NYSDEC Stream (Standard)
- Contours (10ft)
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Delineated Pond
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- NWI Wetland
- NYSDEC Freshwater Wetland
- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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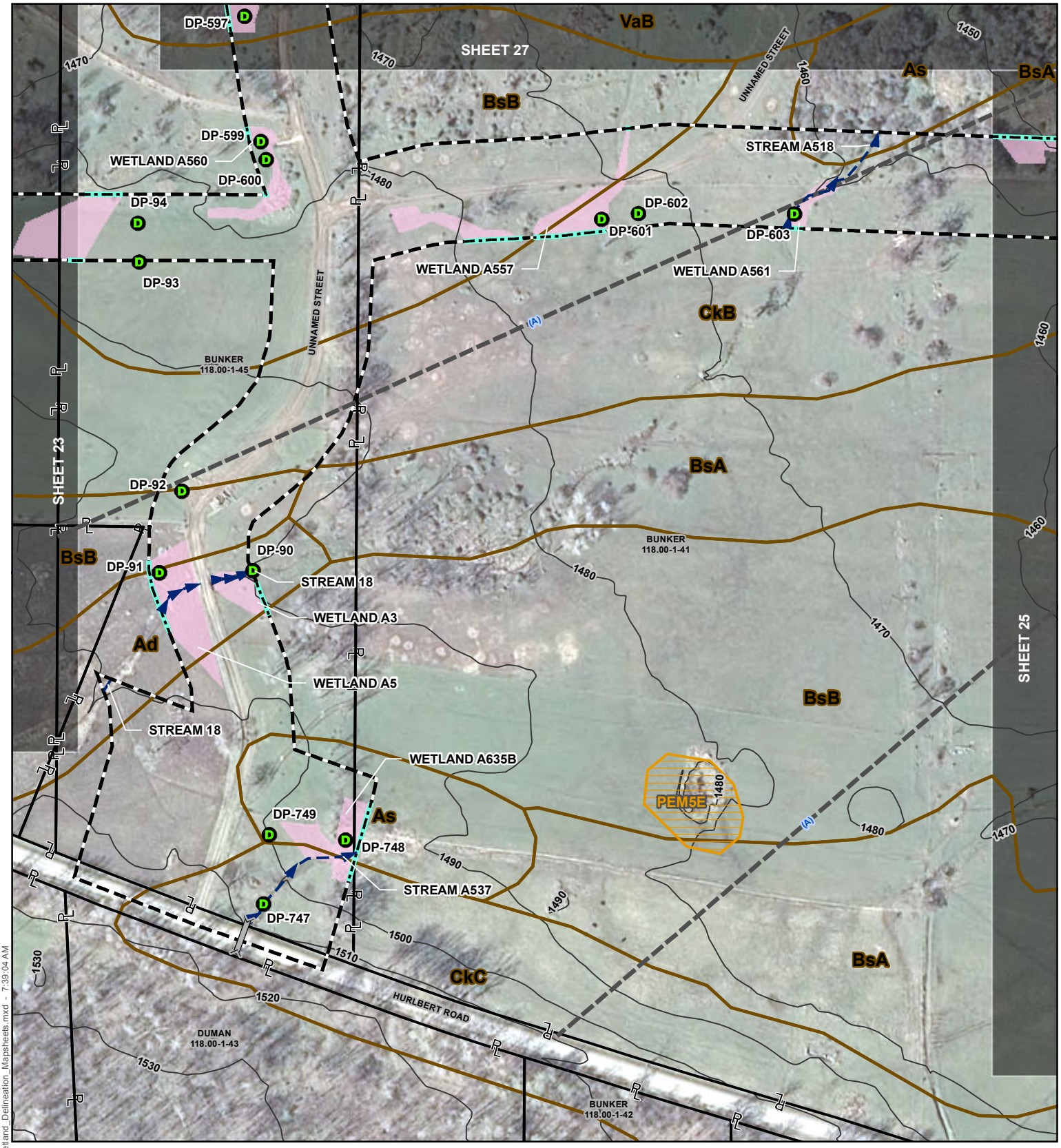

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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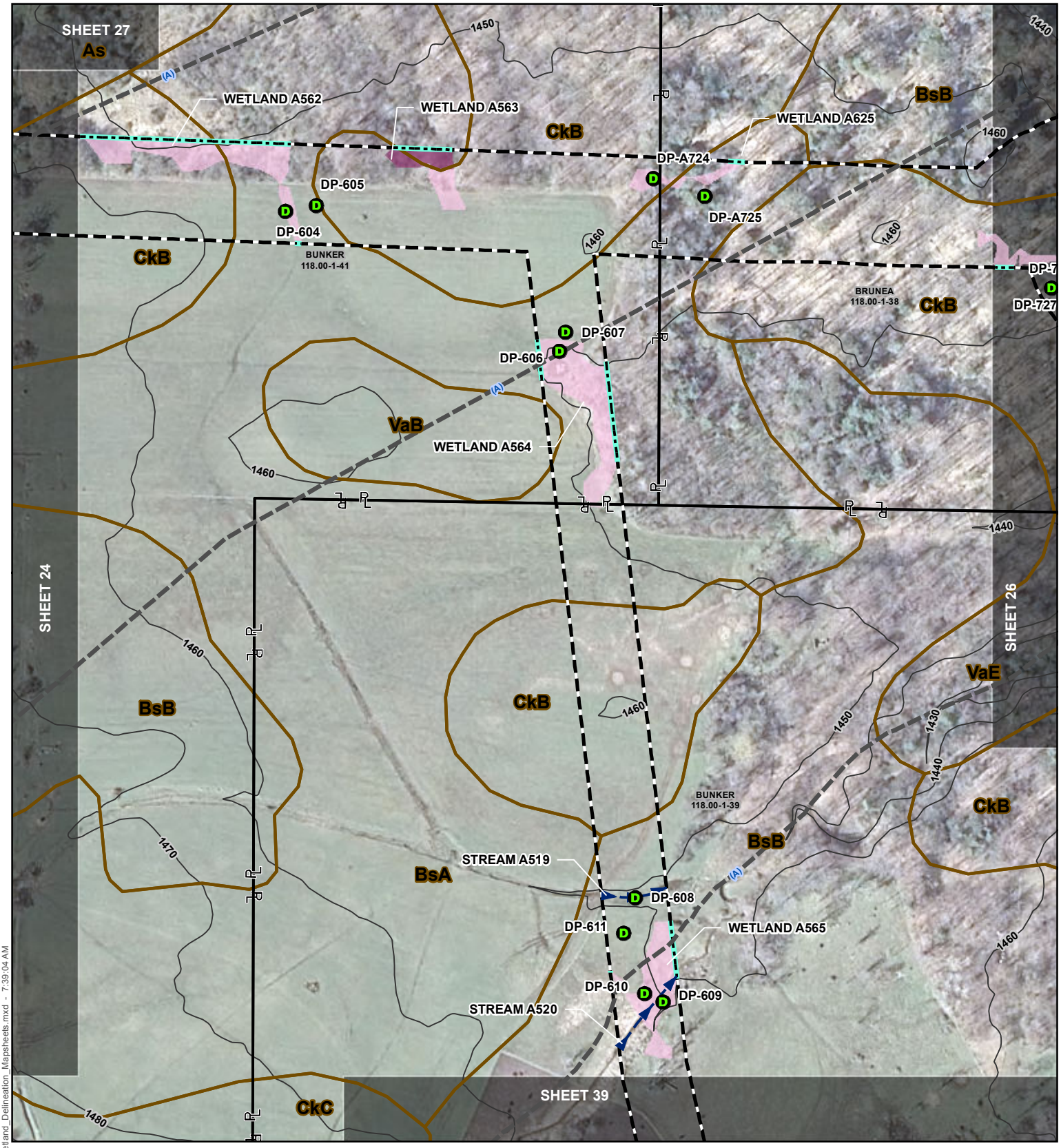

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
- NYSDEC Stream (Standard)
- Contours (10ft)
- Delineated Intermittent Stream
- Delineated Perennial Stream
- Delineated Pond
- Delineated PEM Wetland
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- Delineated PSS Wetland
- NWI Wetland
- NYSDEC Freshwater Wetland
- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
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- Delineated Pond
- Delineated PEM Wetland
- Delineated PFO Wetland
- Delineated PSS Wetland
- NWI Wetland
- NYSDEC Freshwater Wetland
- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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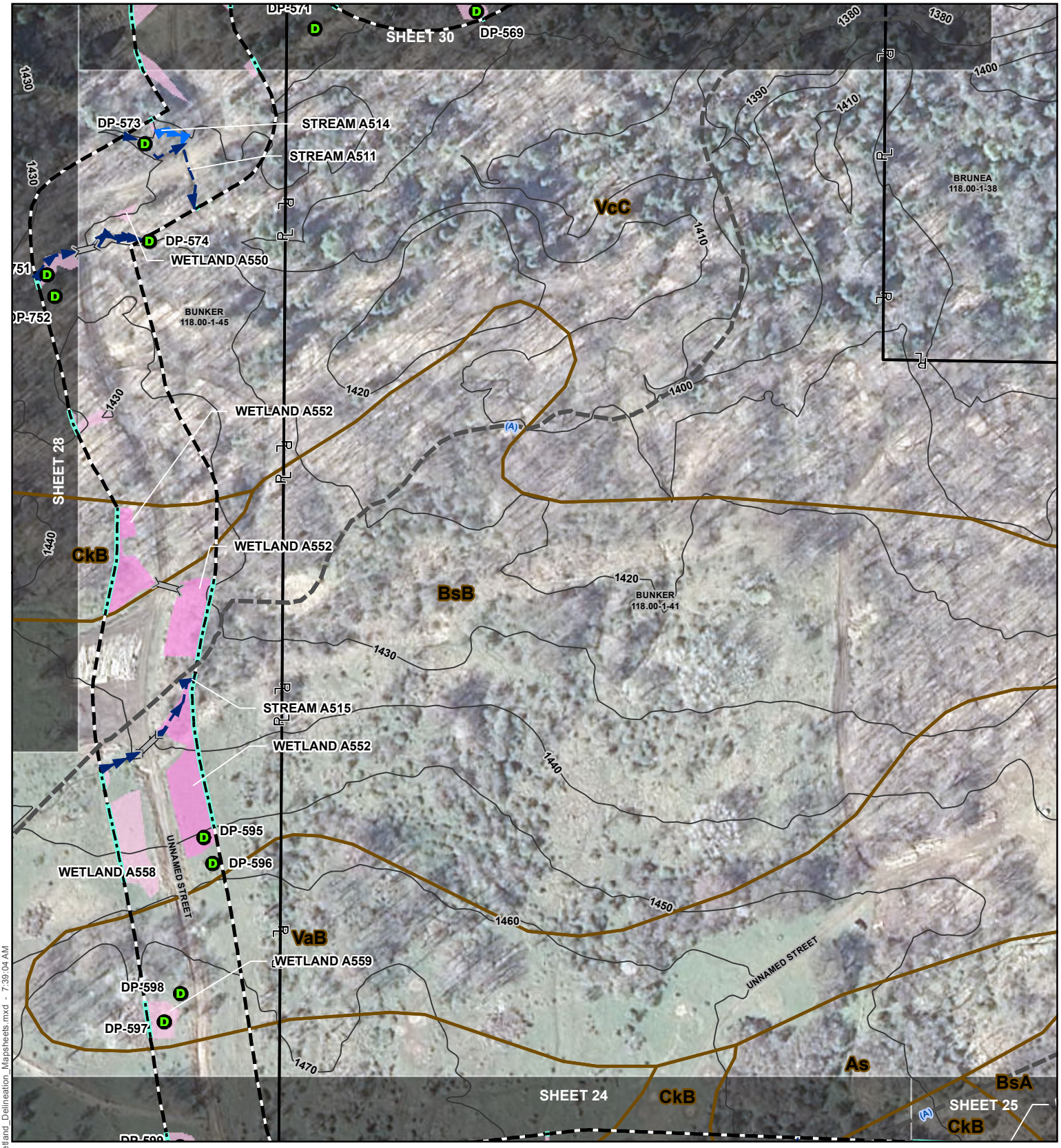

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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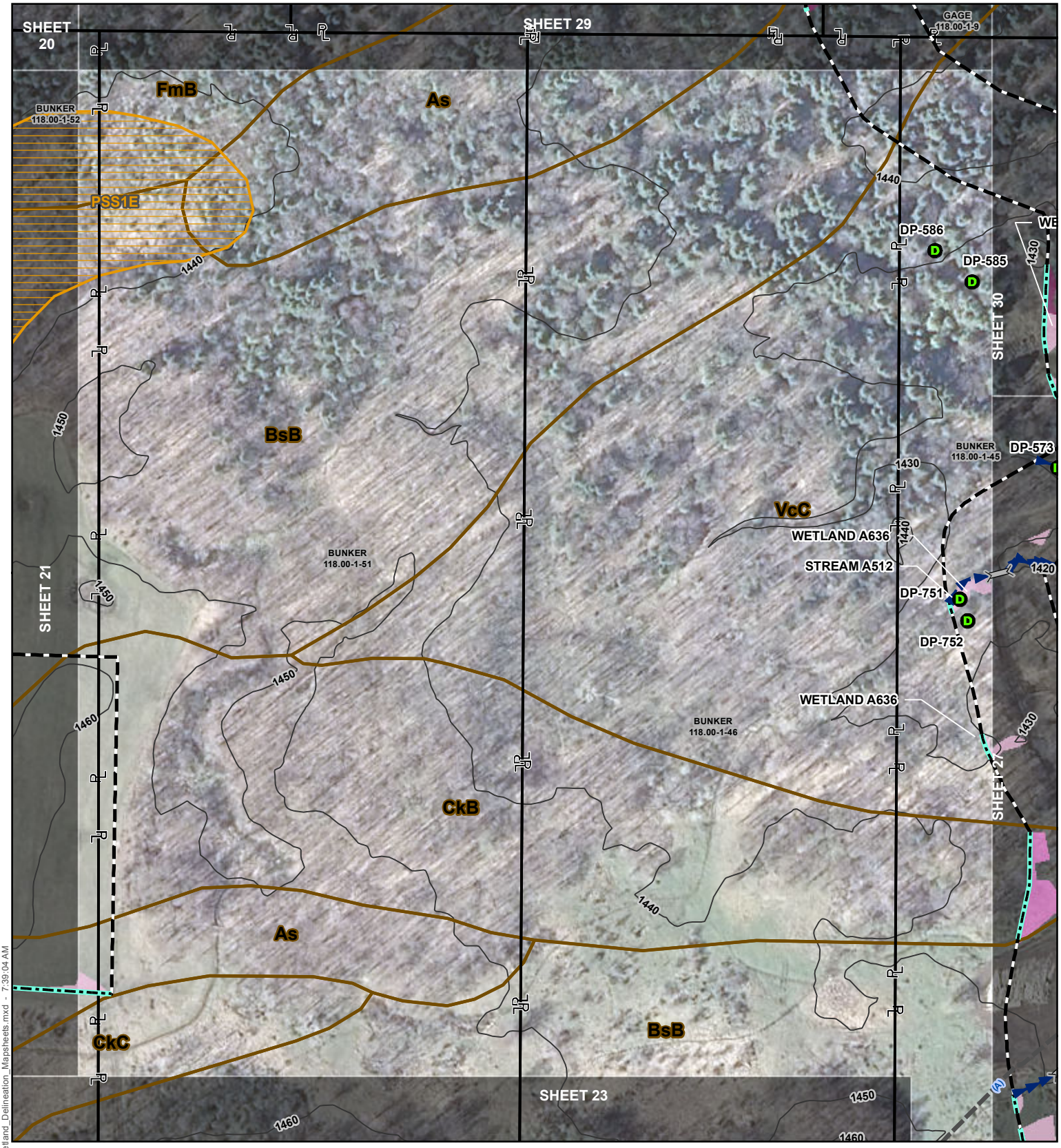

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- Data Point
- Proposed Turbine
- Culvert
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- Delineated Intermittent Stream
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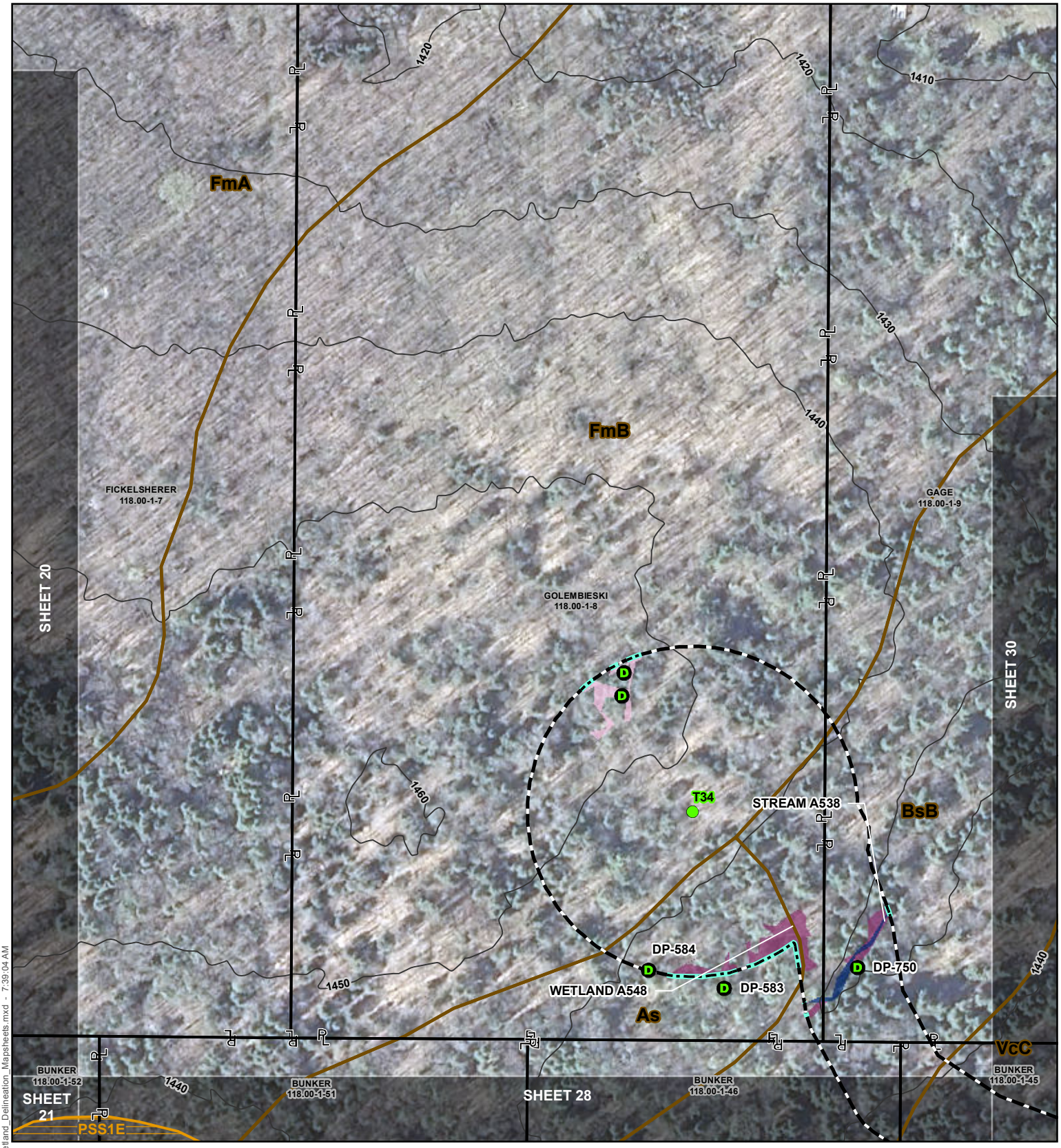

- Data Point
- Proposed Turbine
- Culvert
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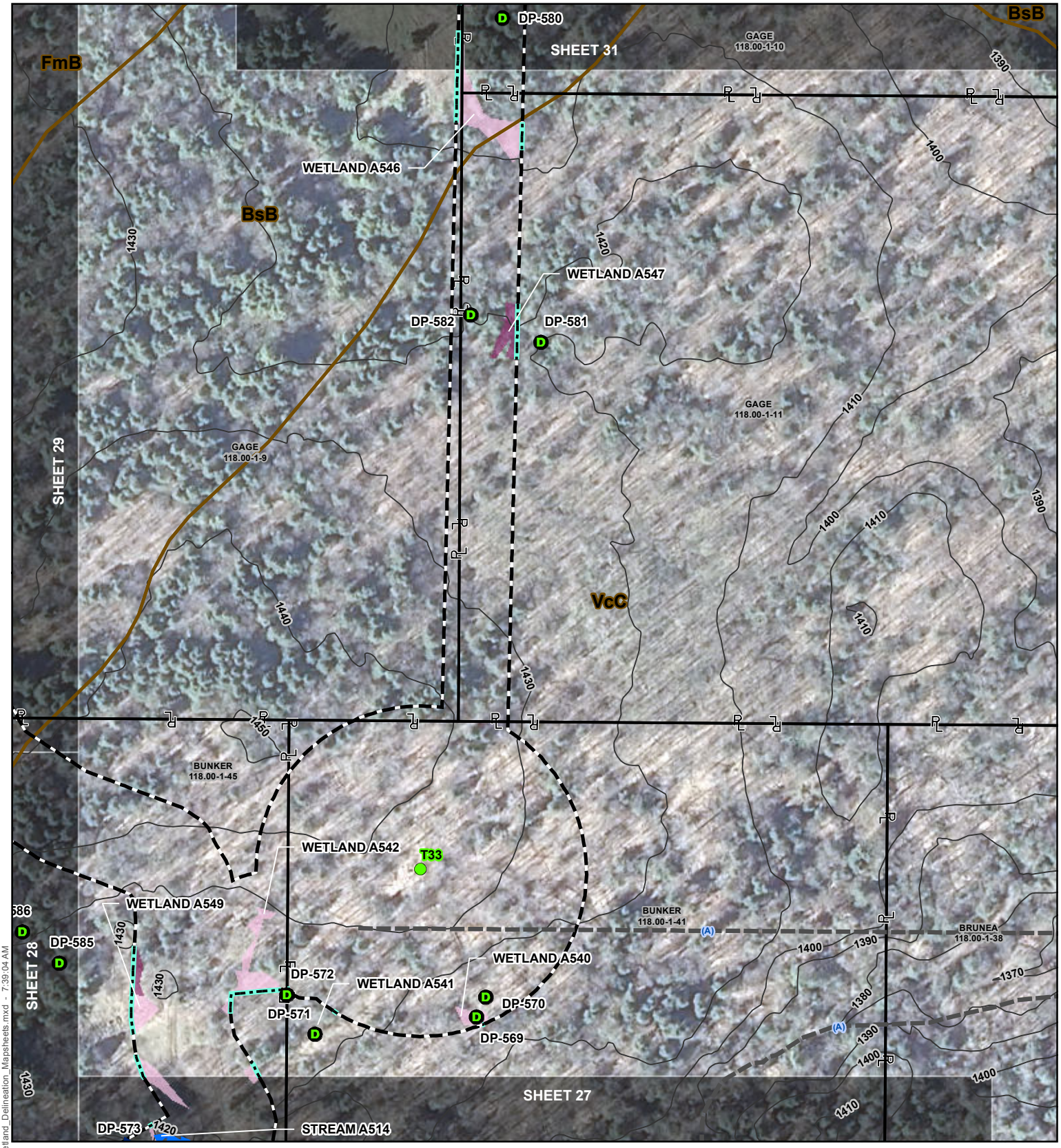

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
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0 100 200 Feet

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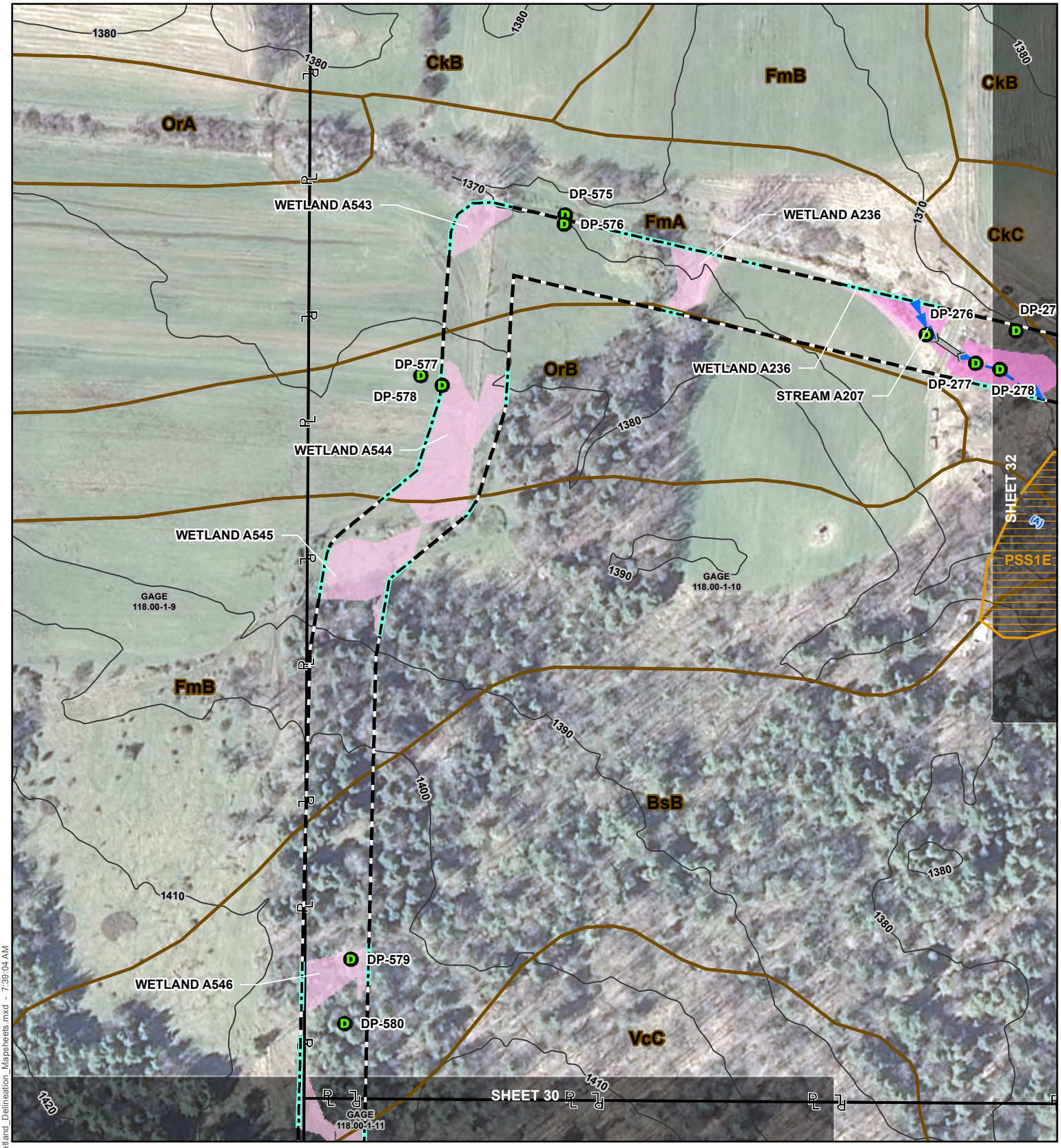

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Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream
NYSDEC Stream (Standard)
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0 100 200 Feet

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- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
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- Delineated Perennial Stream
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- Soil Complex Boundary
- Parcel
- Project Study Limits
- Matchline

0 100 200 Feet

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Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
Contours (10ft)
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Delineated Perennial Stream
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Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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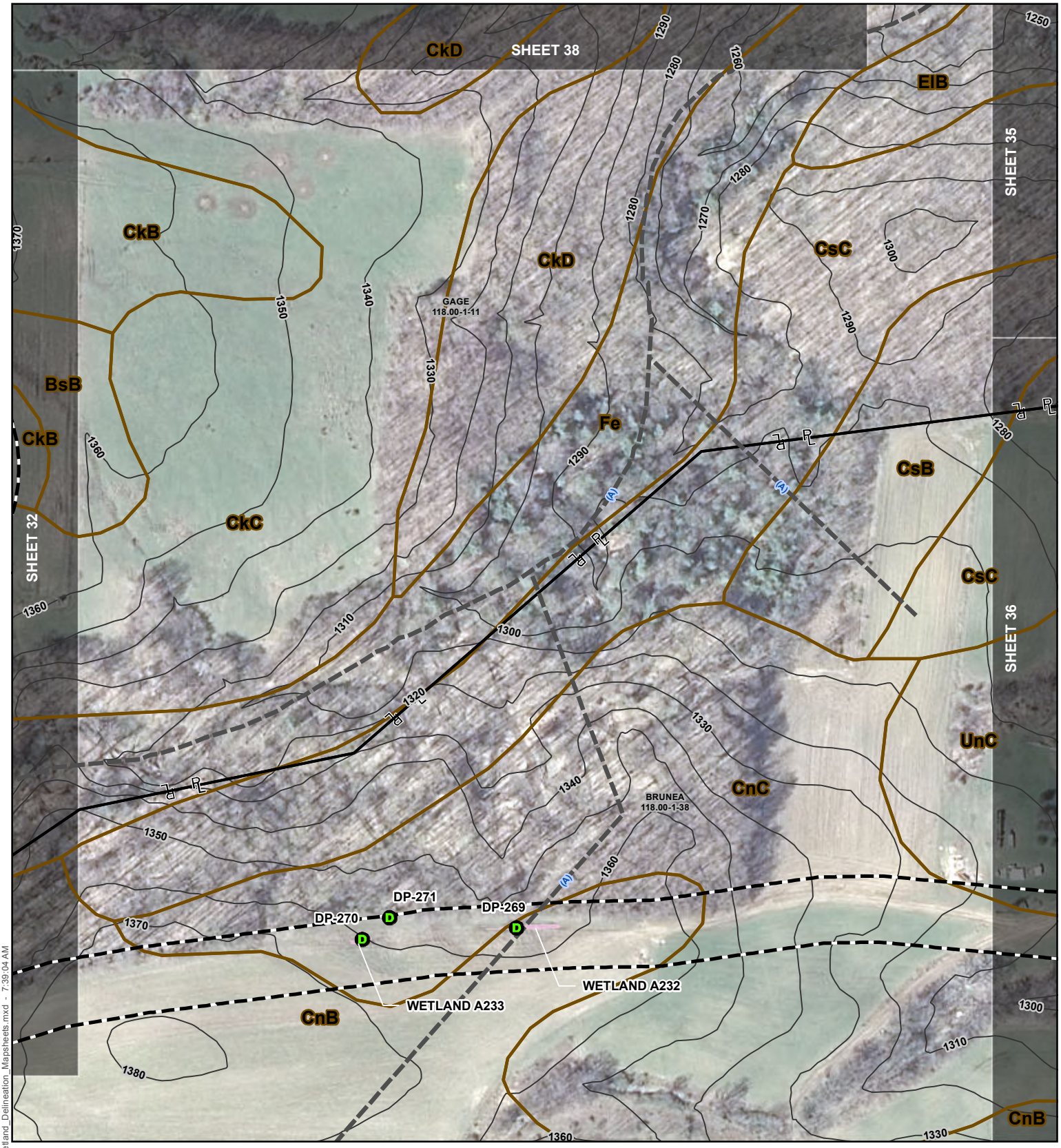

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
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Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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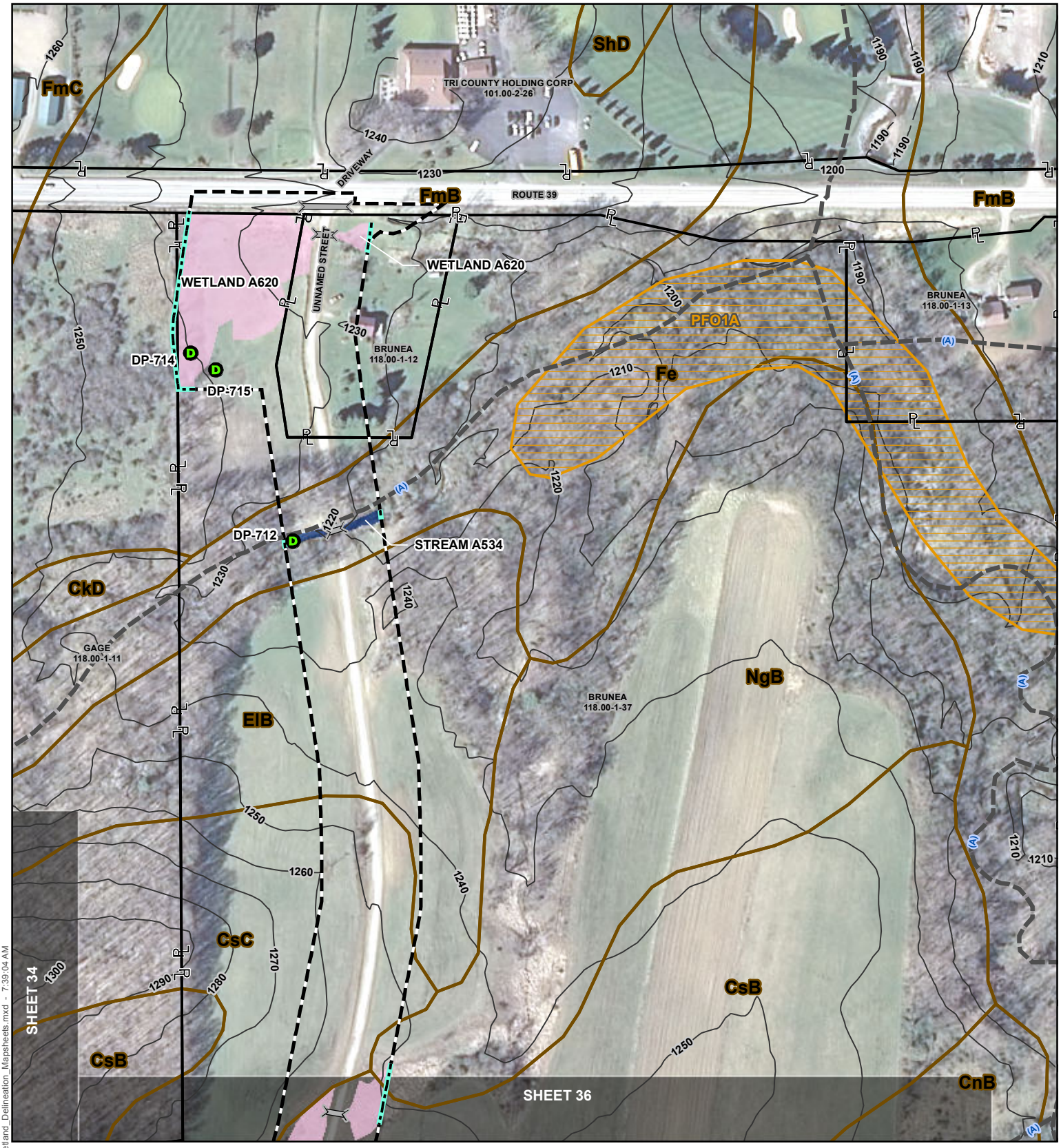

- Data Point
- Proposed Turbine
- Culvert
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0 100 200 Feet

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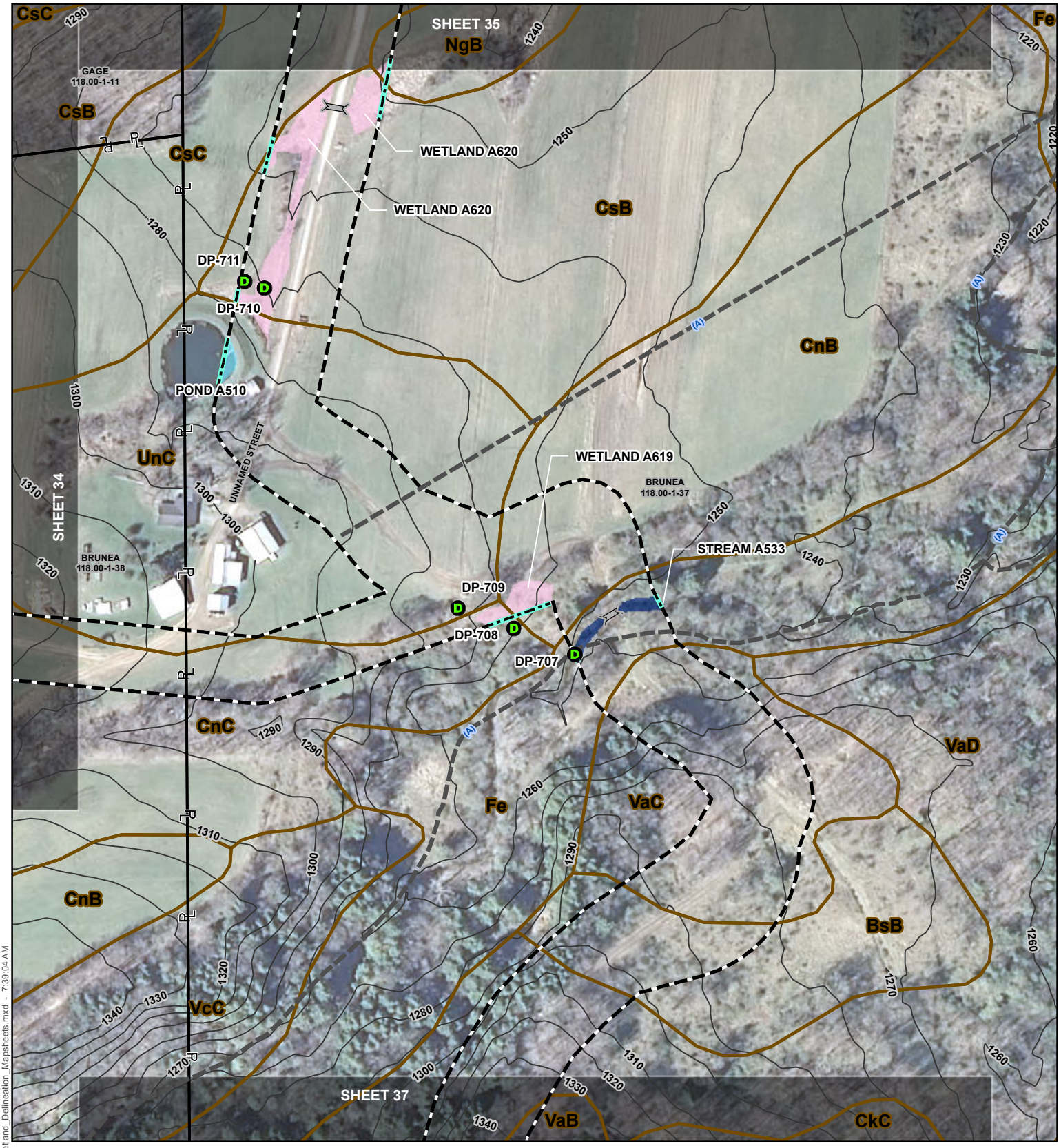

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
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Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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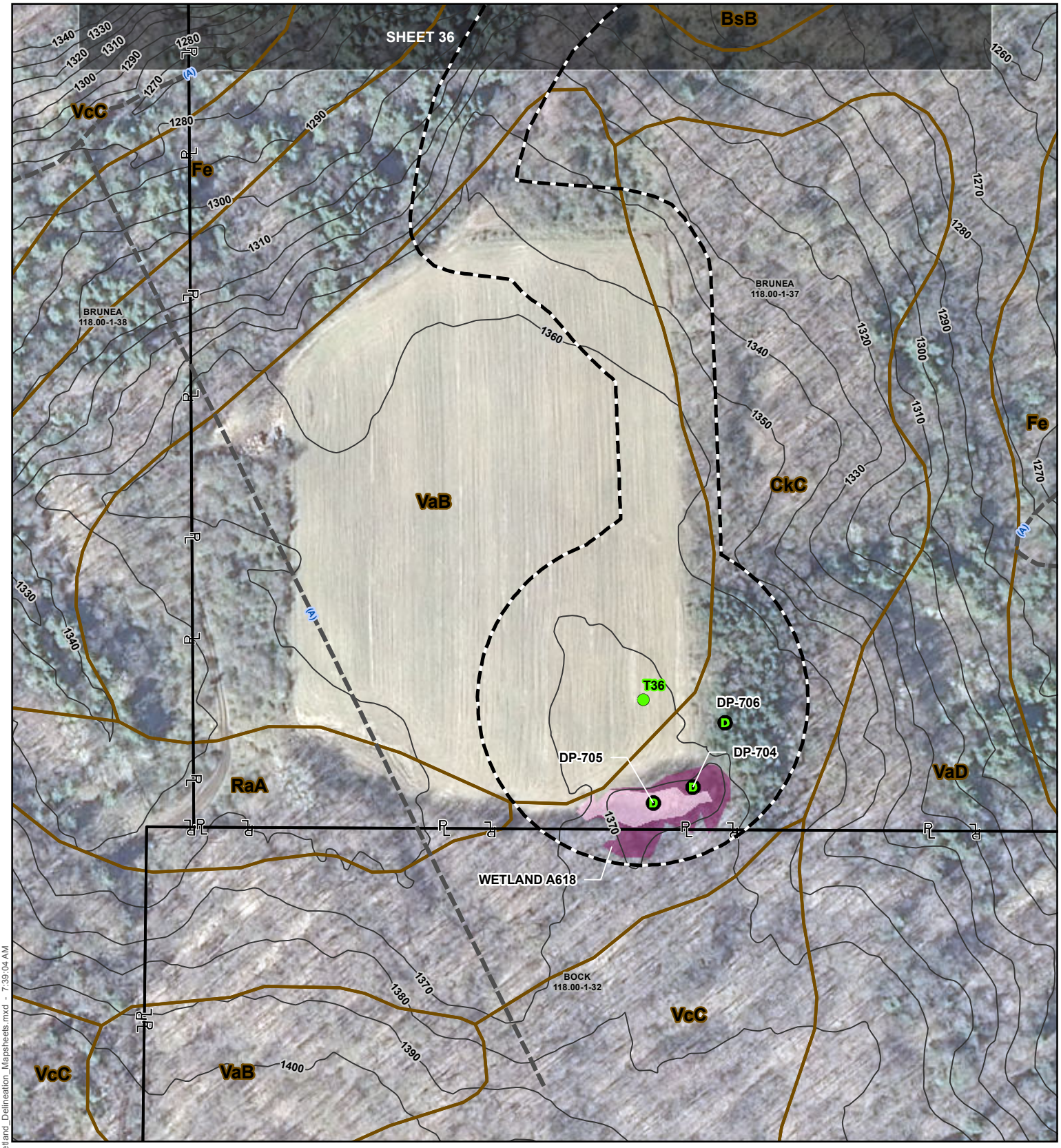

Data Point	NYSDEC Stream (Standard)	NWI Wetland
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Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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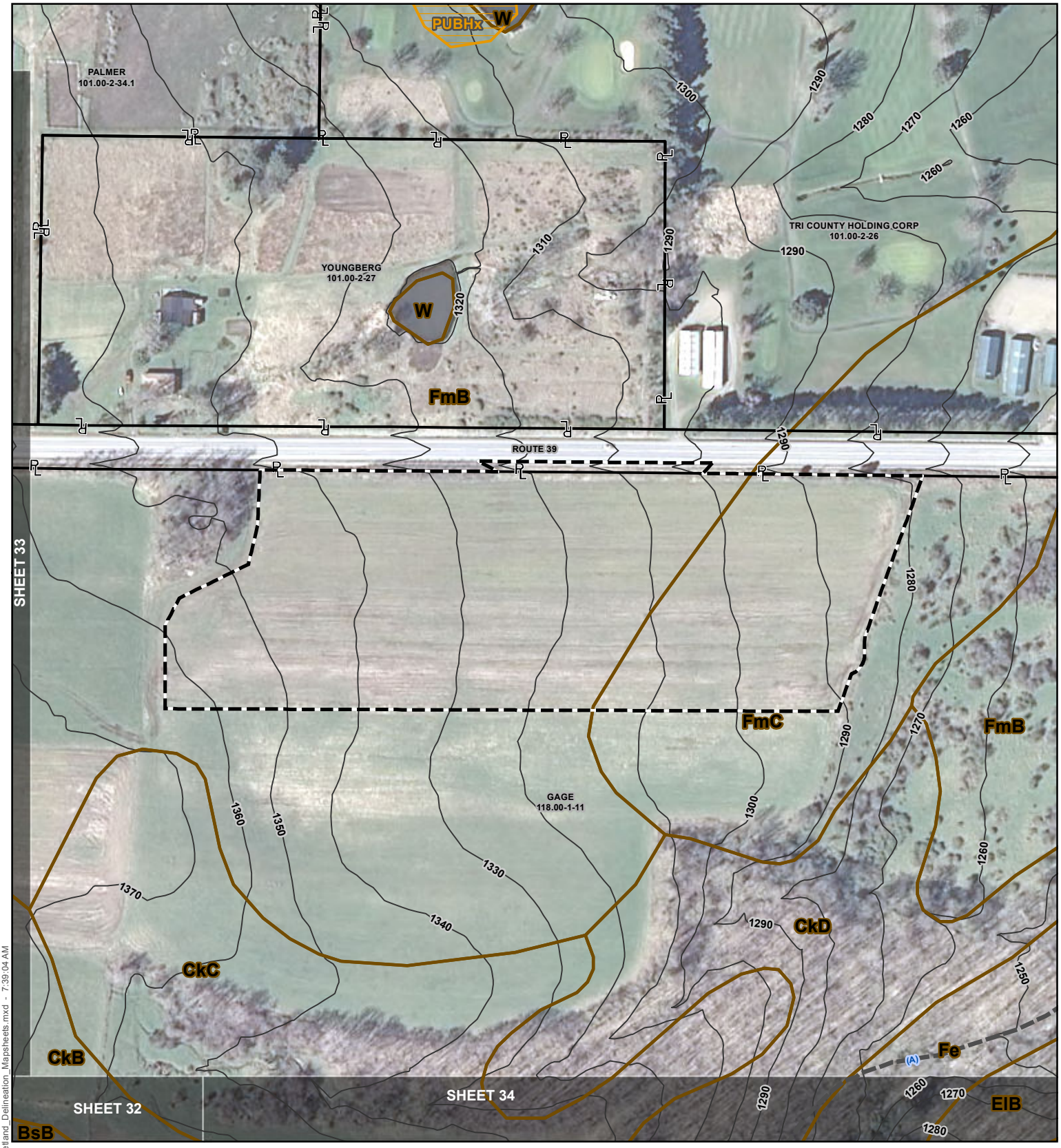

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Data Point	NYSDEC Stream (Standard)	NWI Wetland
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Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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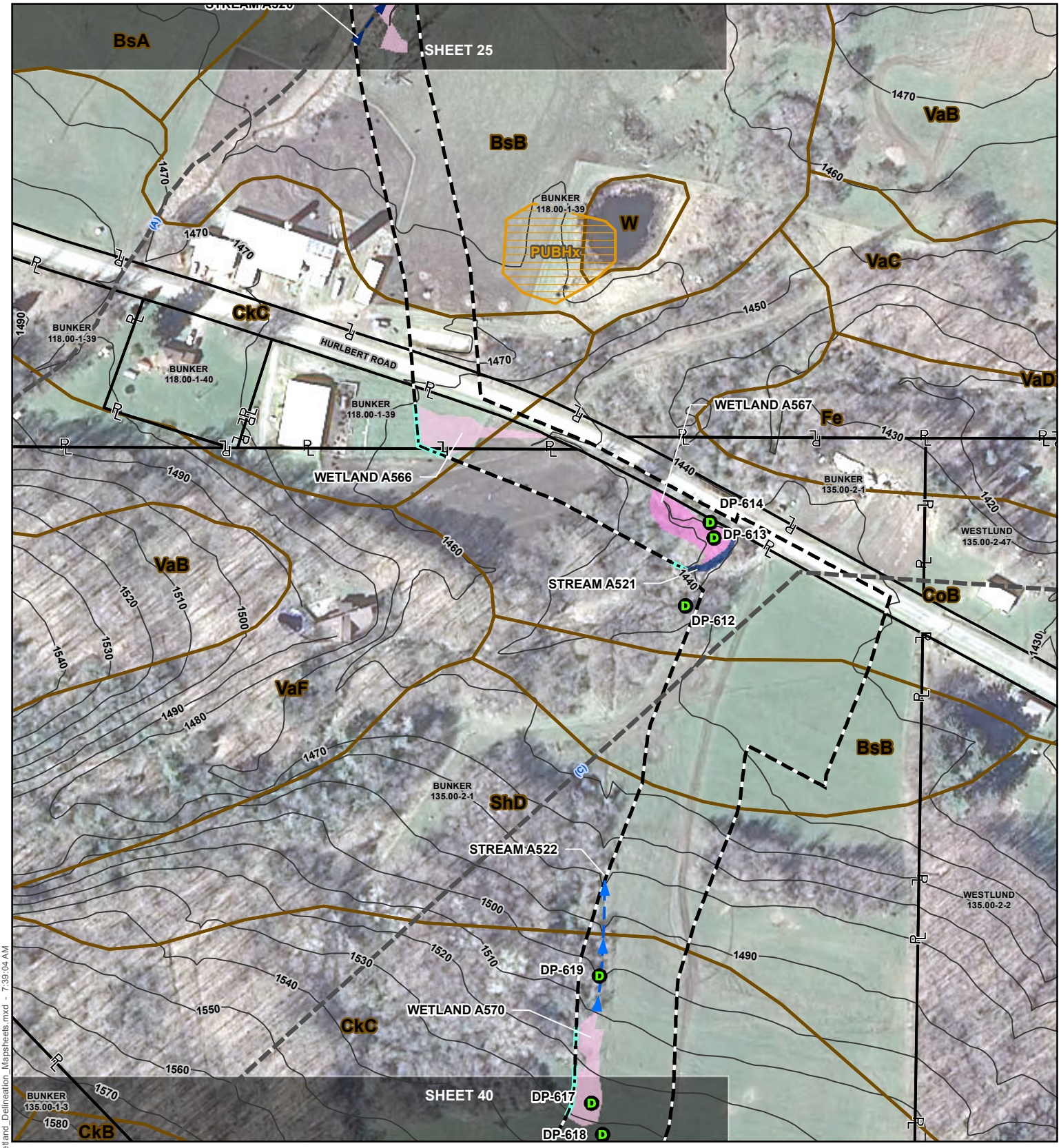

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0 100 200 Feet

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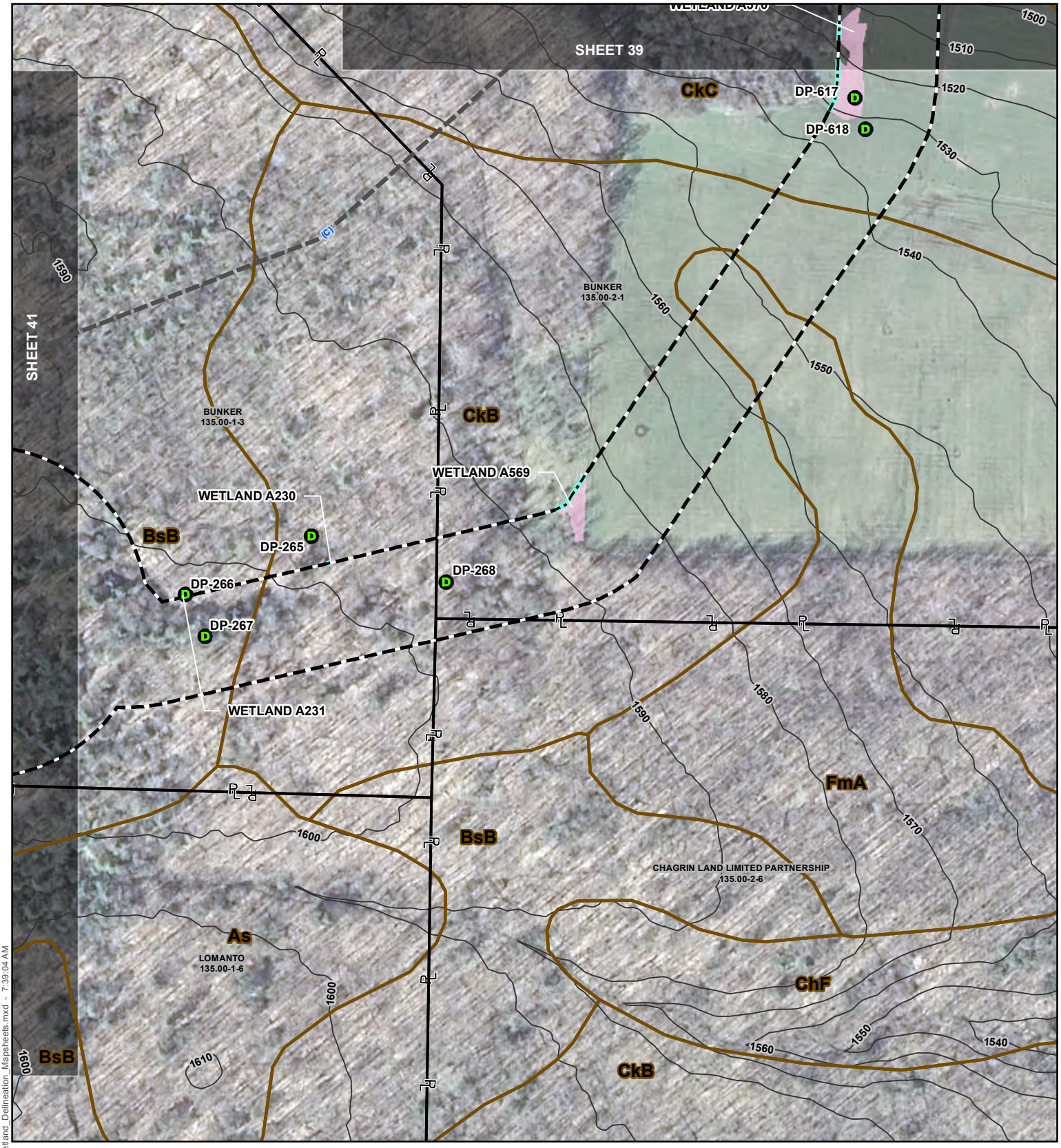

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0 100 200 Feet

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Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

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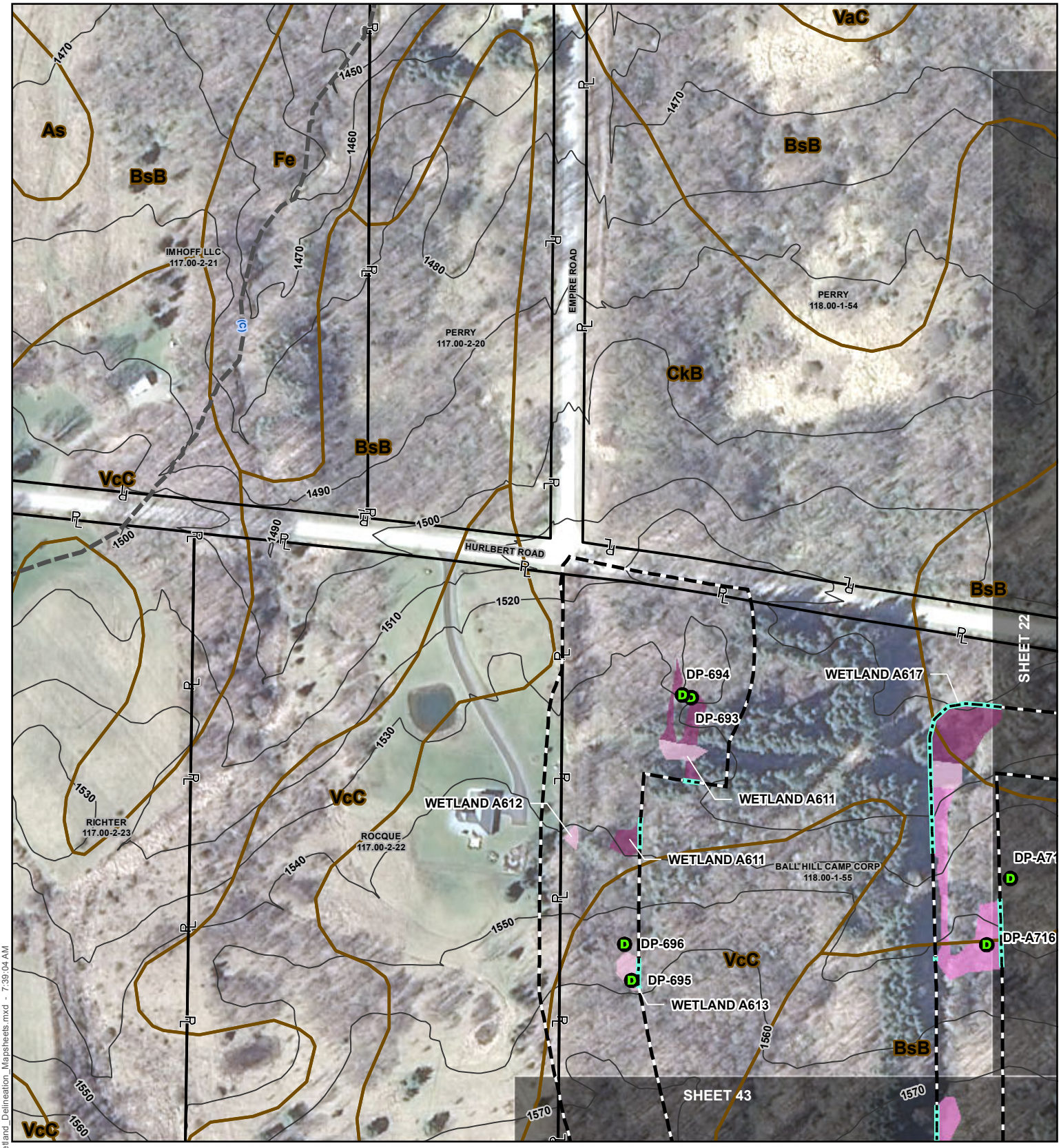

- Data Point
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- Culvert
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0 100 200 Feet

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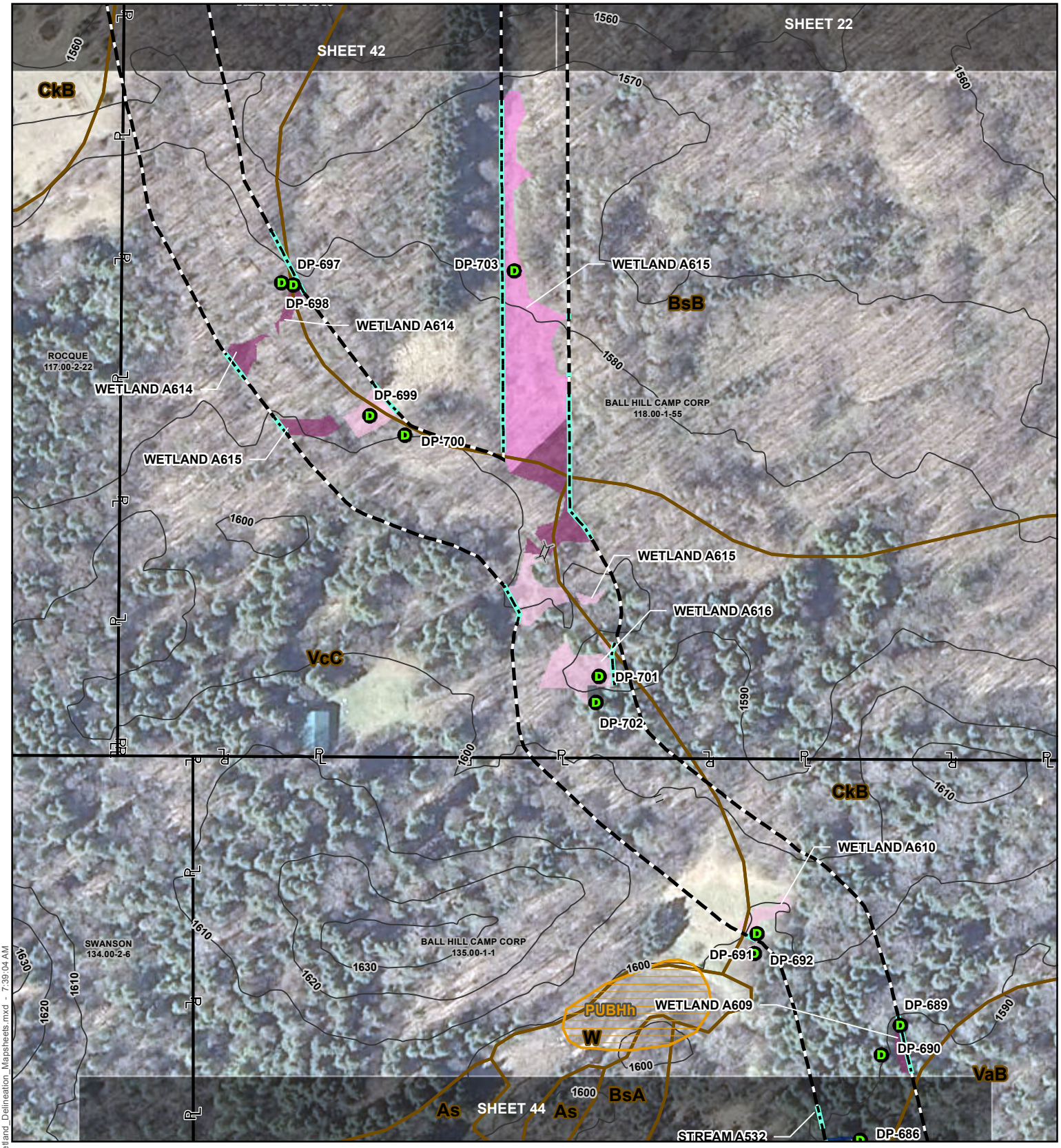

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0 100 200 Feet

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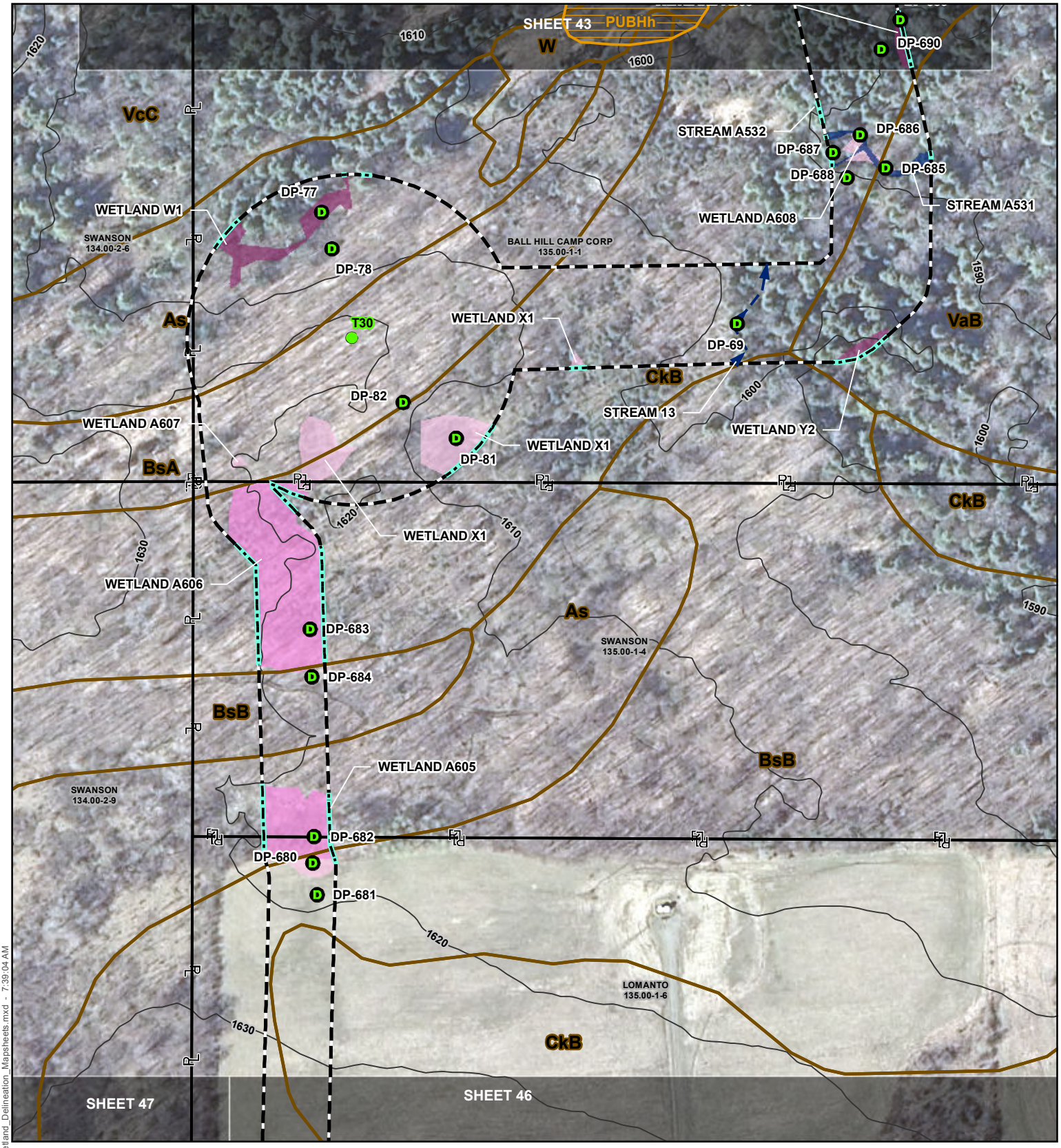

- Data Point
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- Culvert
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0 100 200 Feet

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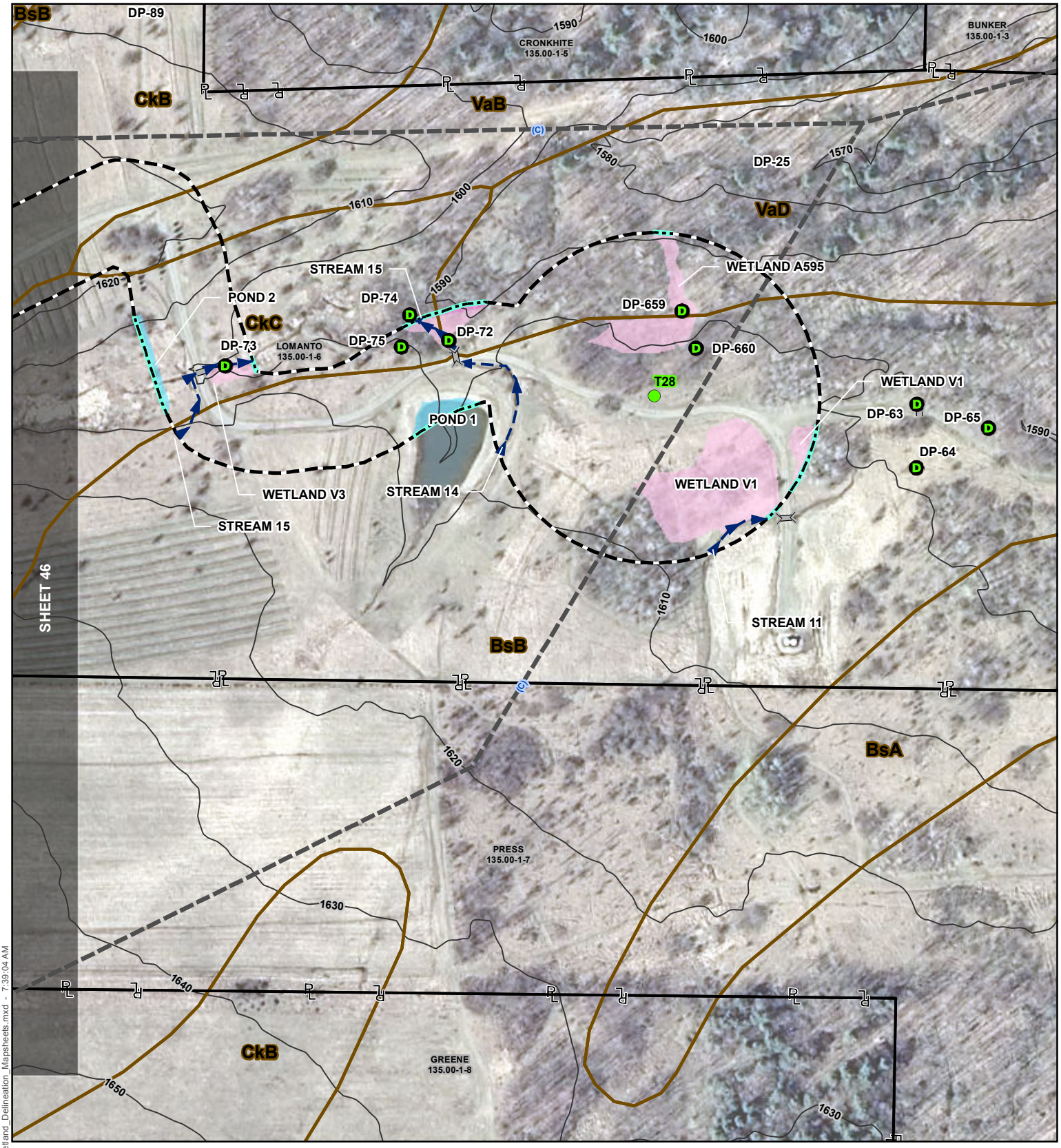

- Data Point
- Proposed Turbine
- Culvert
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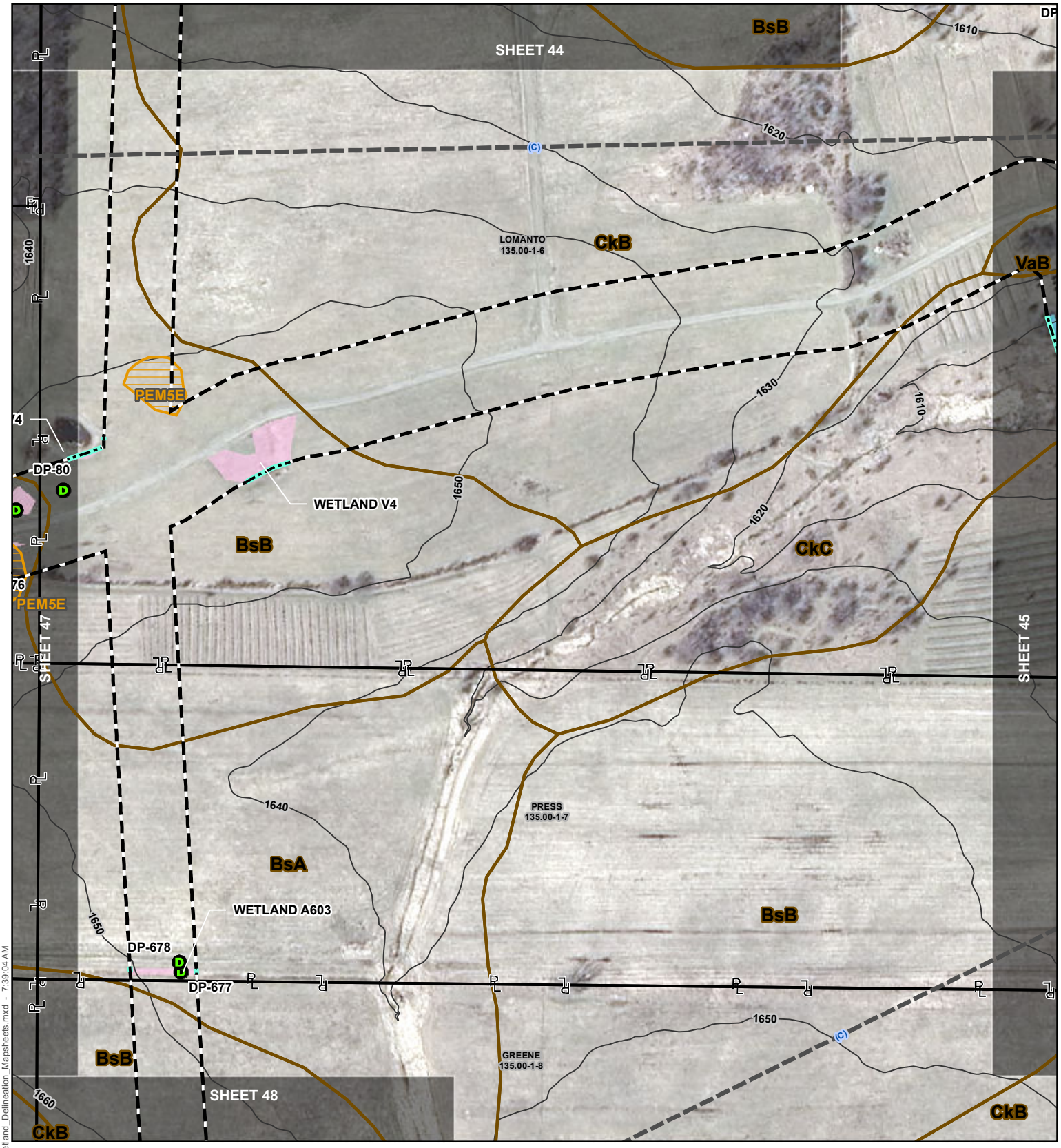

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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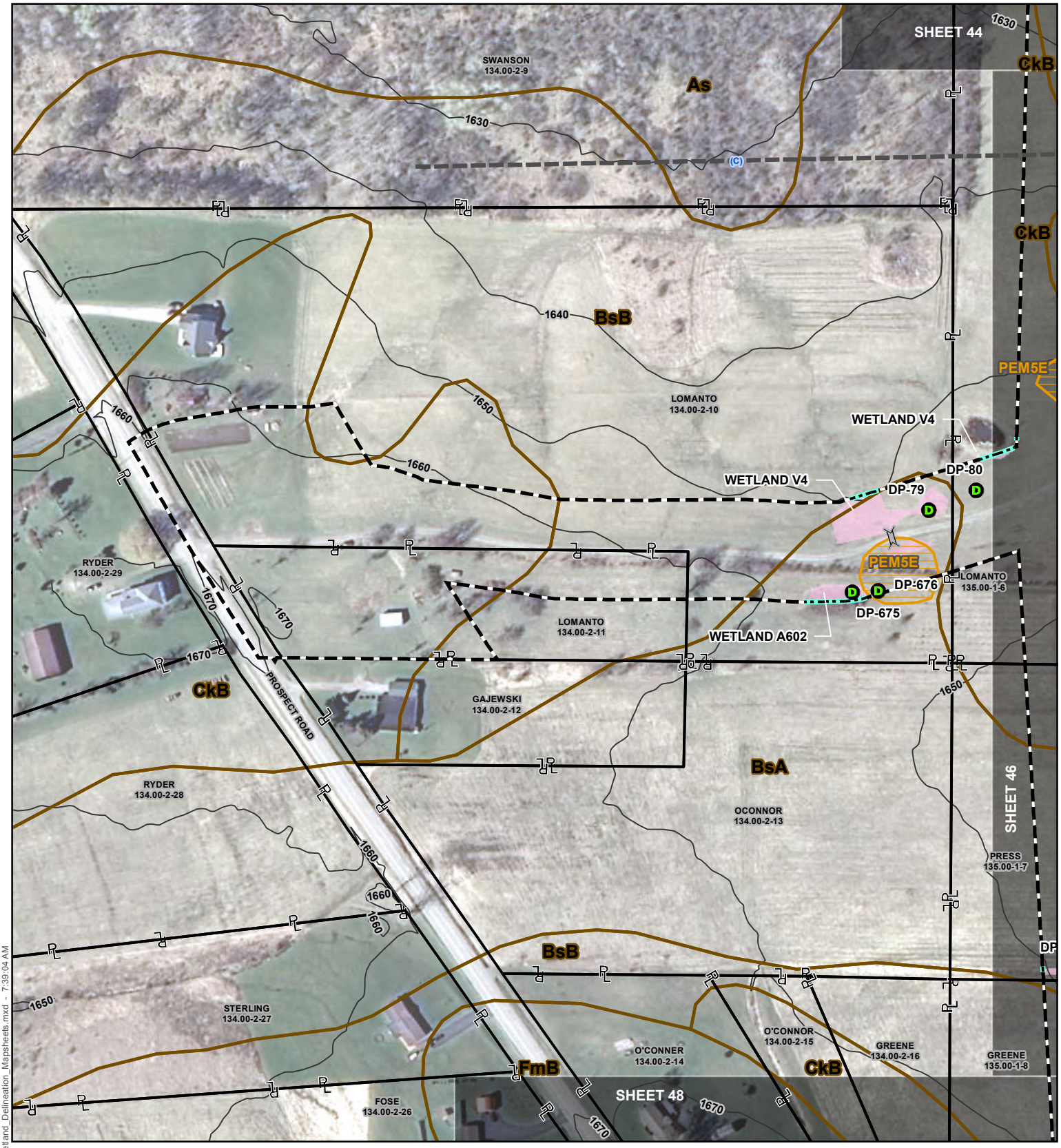

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- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
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- Delineated Perennial Stream
- Delineated Pond
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Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

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Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
Contours (10ft)
Delineated Intermittent Stream
Delineated Perennial Stream
Delineated Pond
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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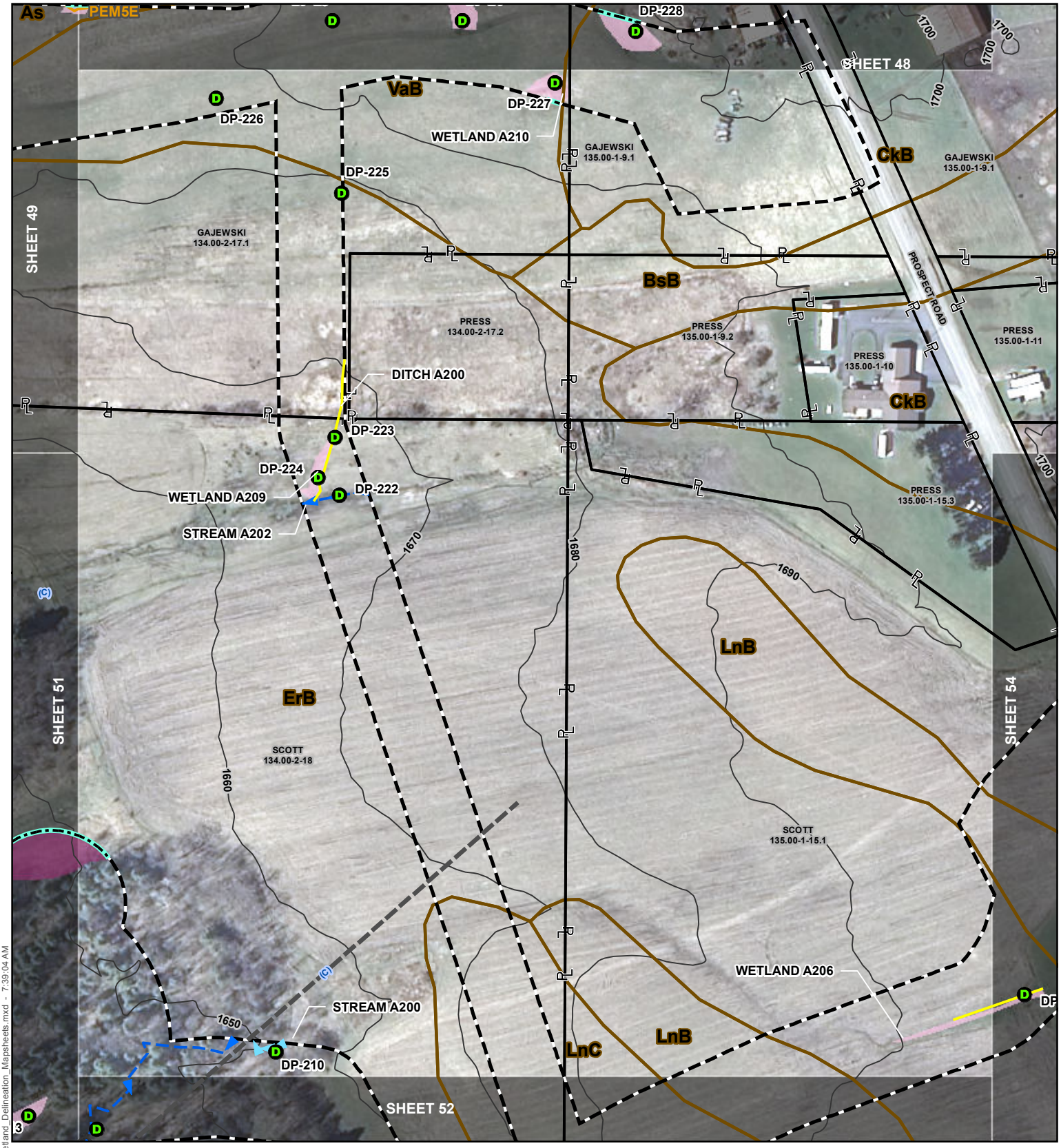

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
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Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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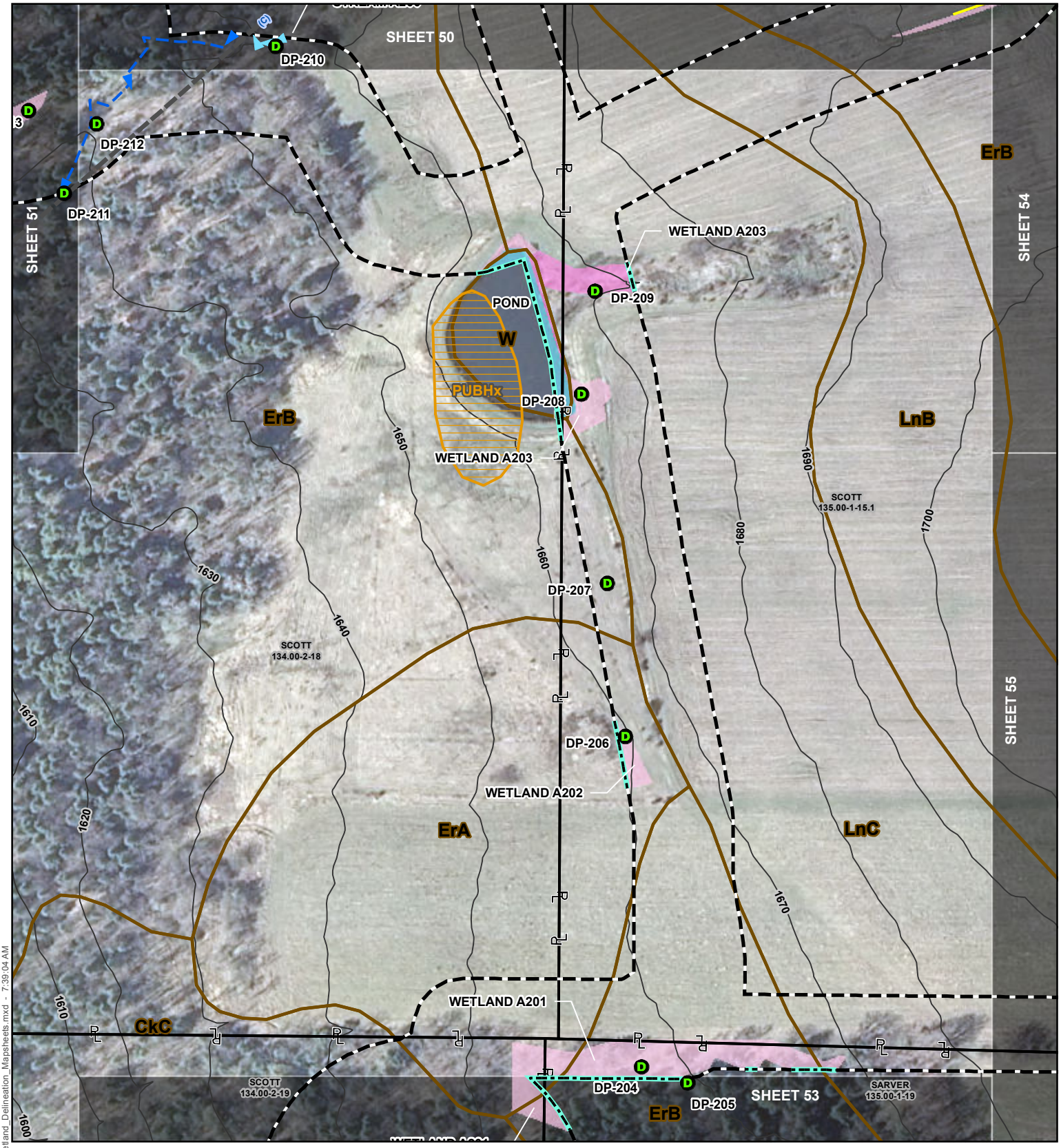

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
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Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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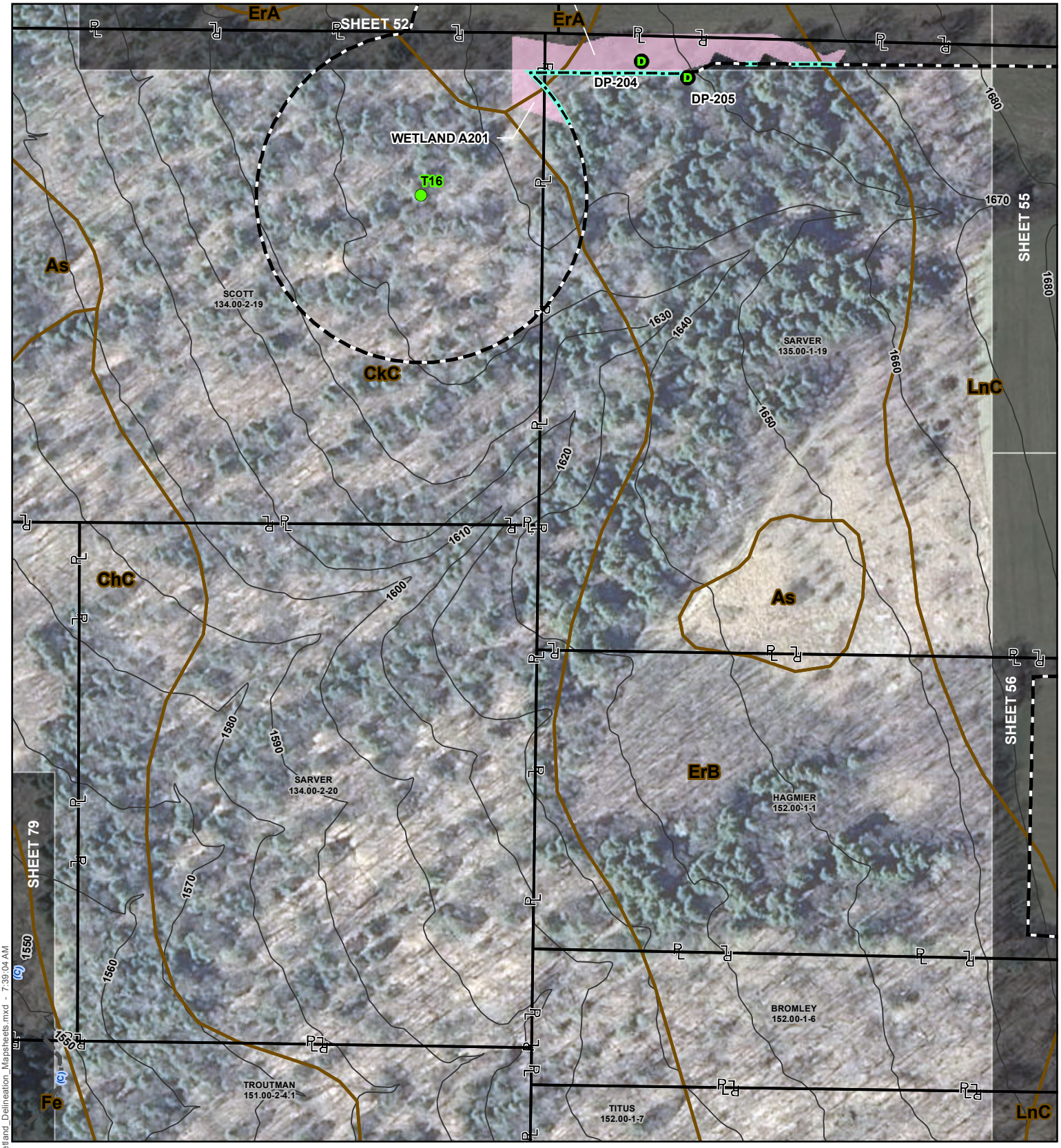

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
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NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
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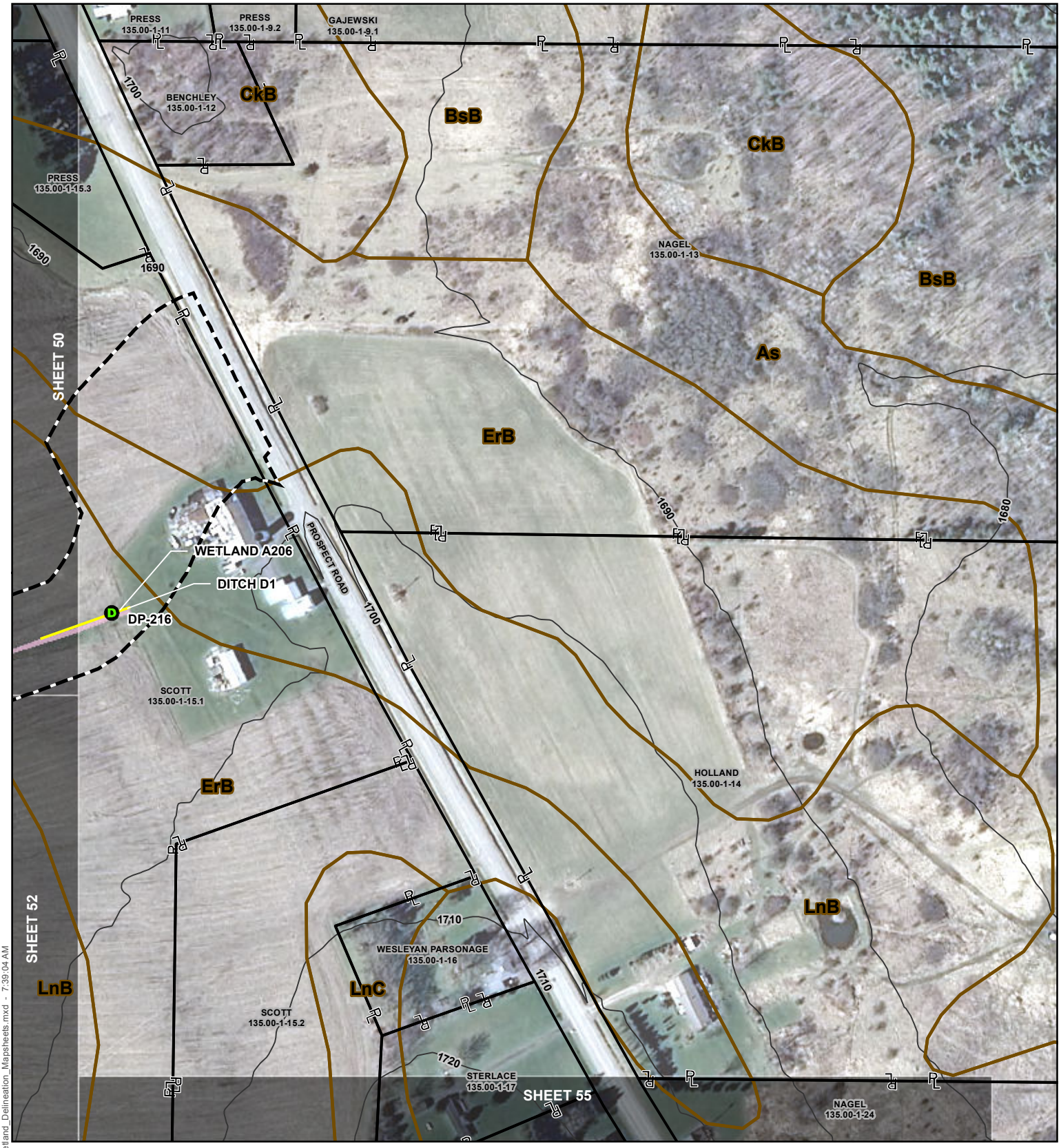

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
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- Matchline

0 100 200 Feet

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0 100 200 Feet

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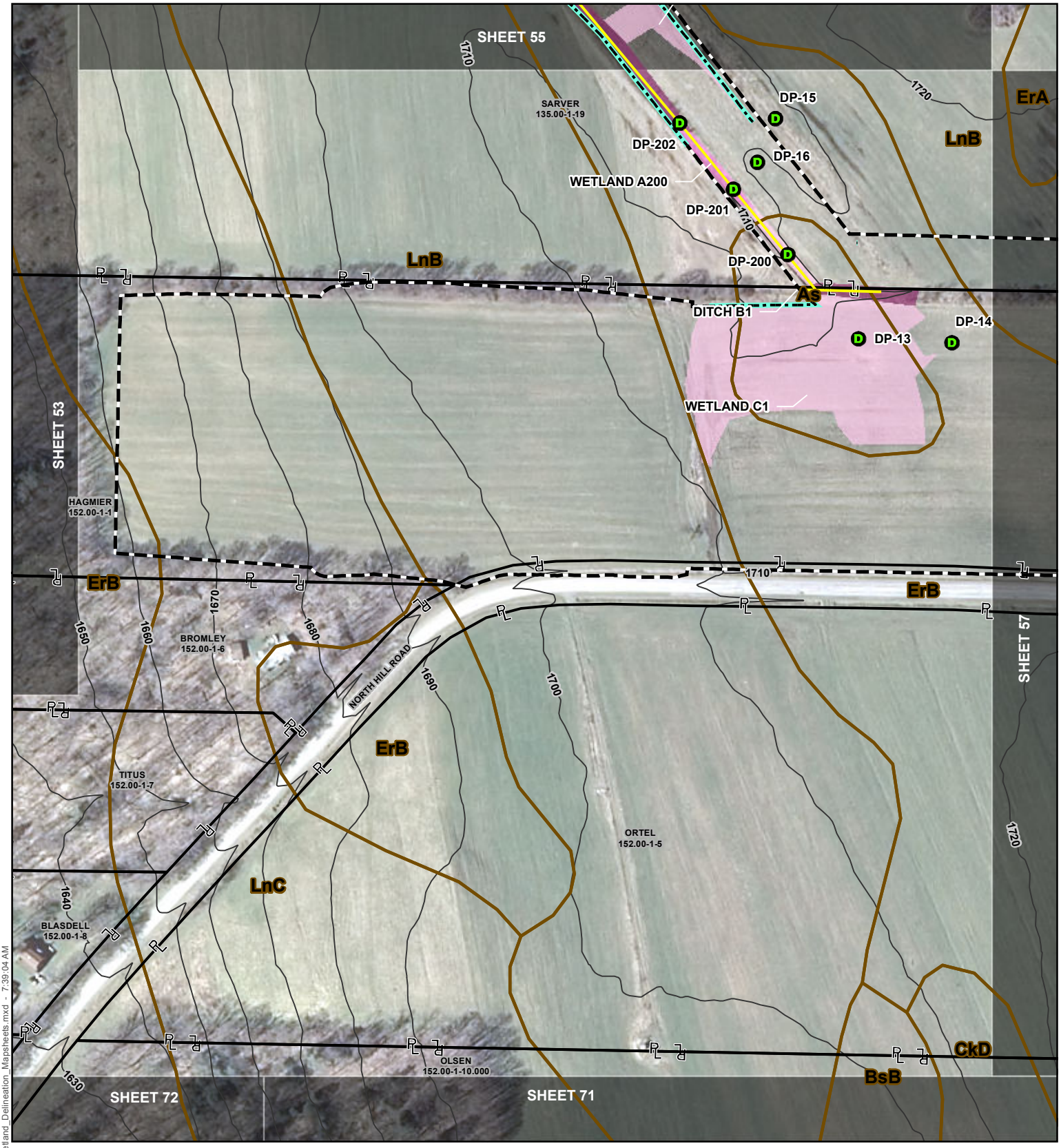

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
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Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
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Delineated PFO Wetland
Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

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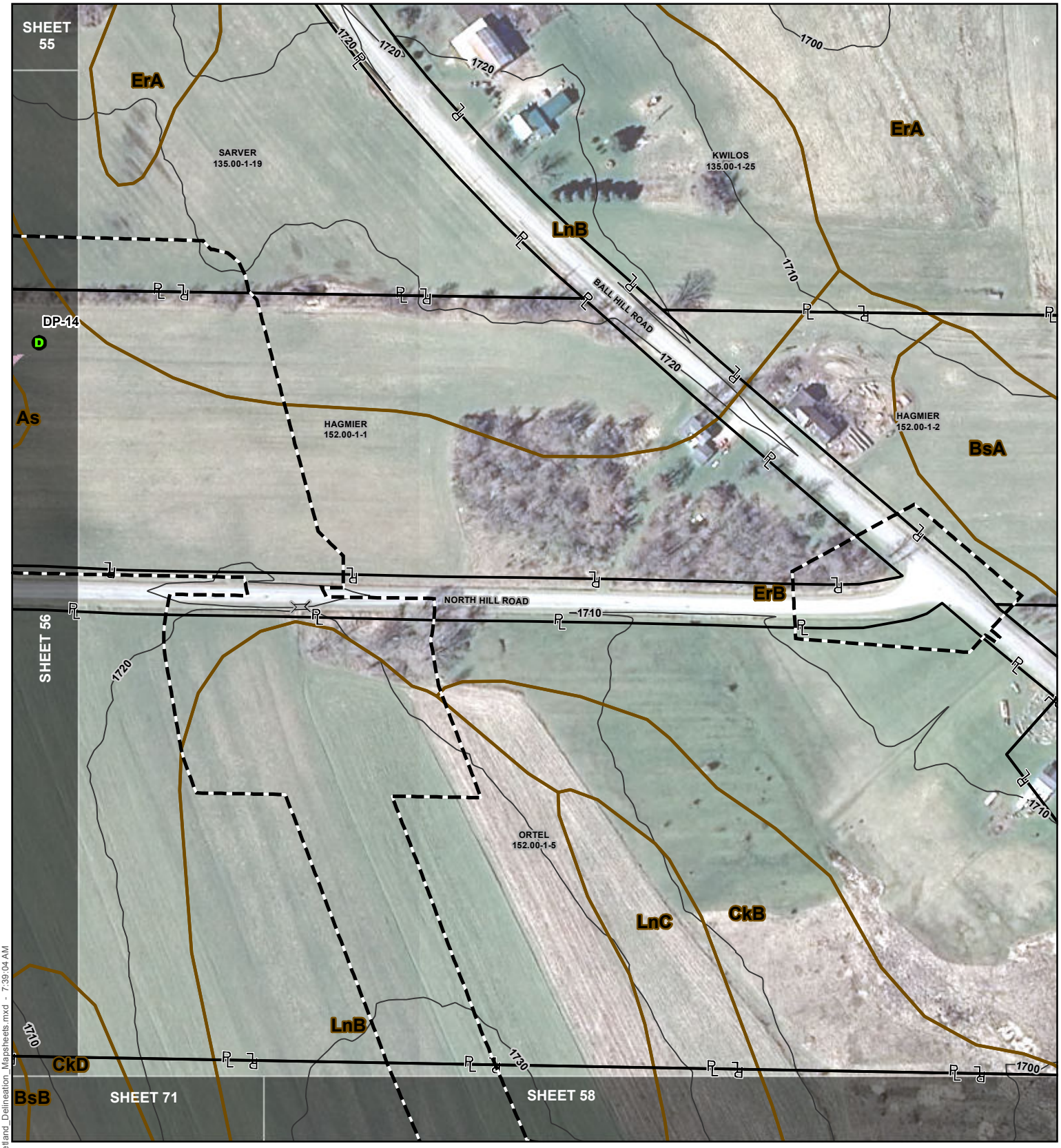

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Data Point	NYSDEC Stream (Standard)	NWI Wetland
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Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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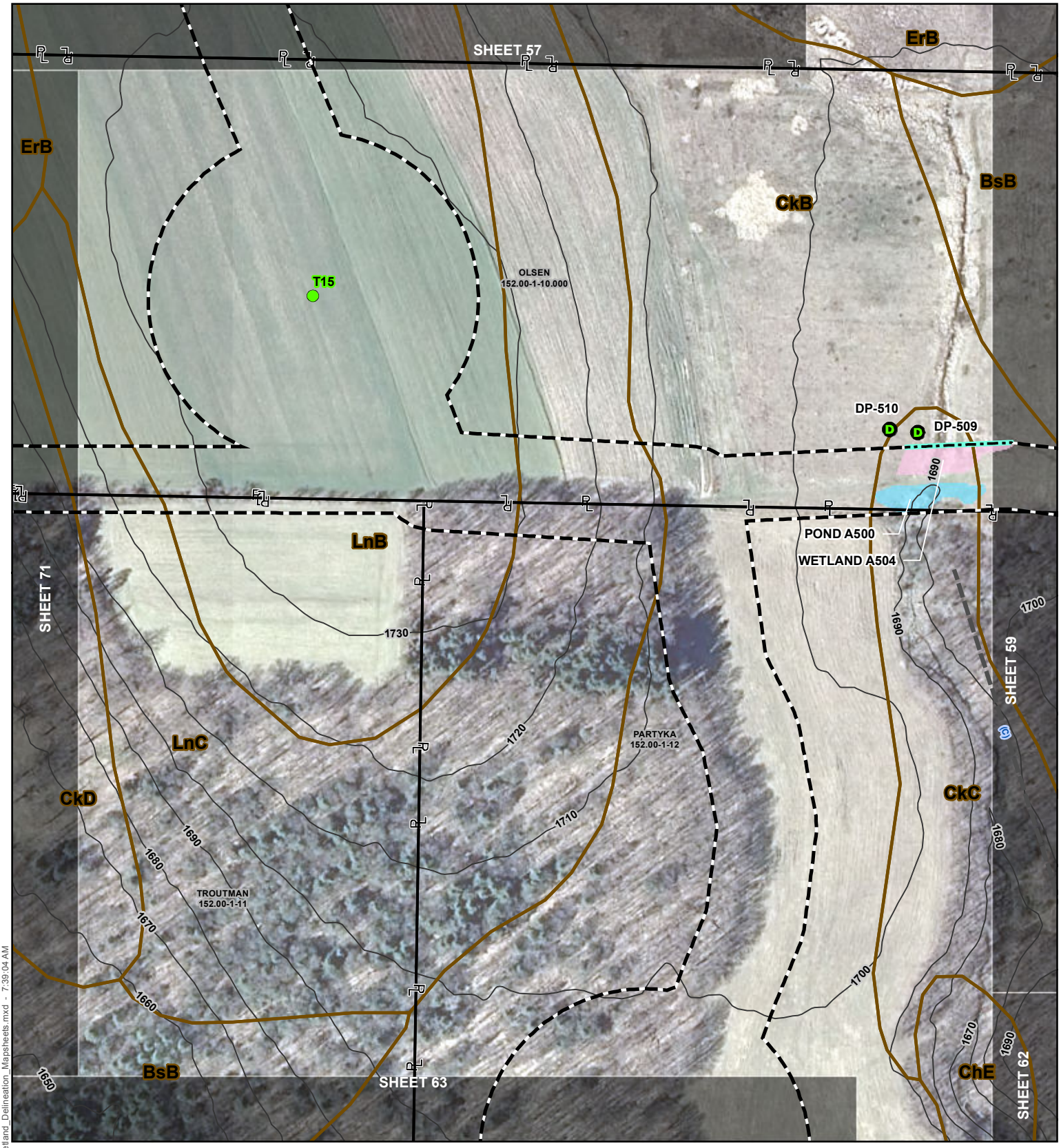

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
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0 100 200 Feet

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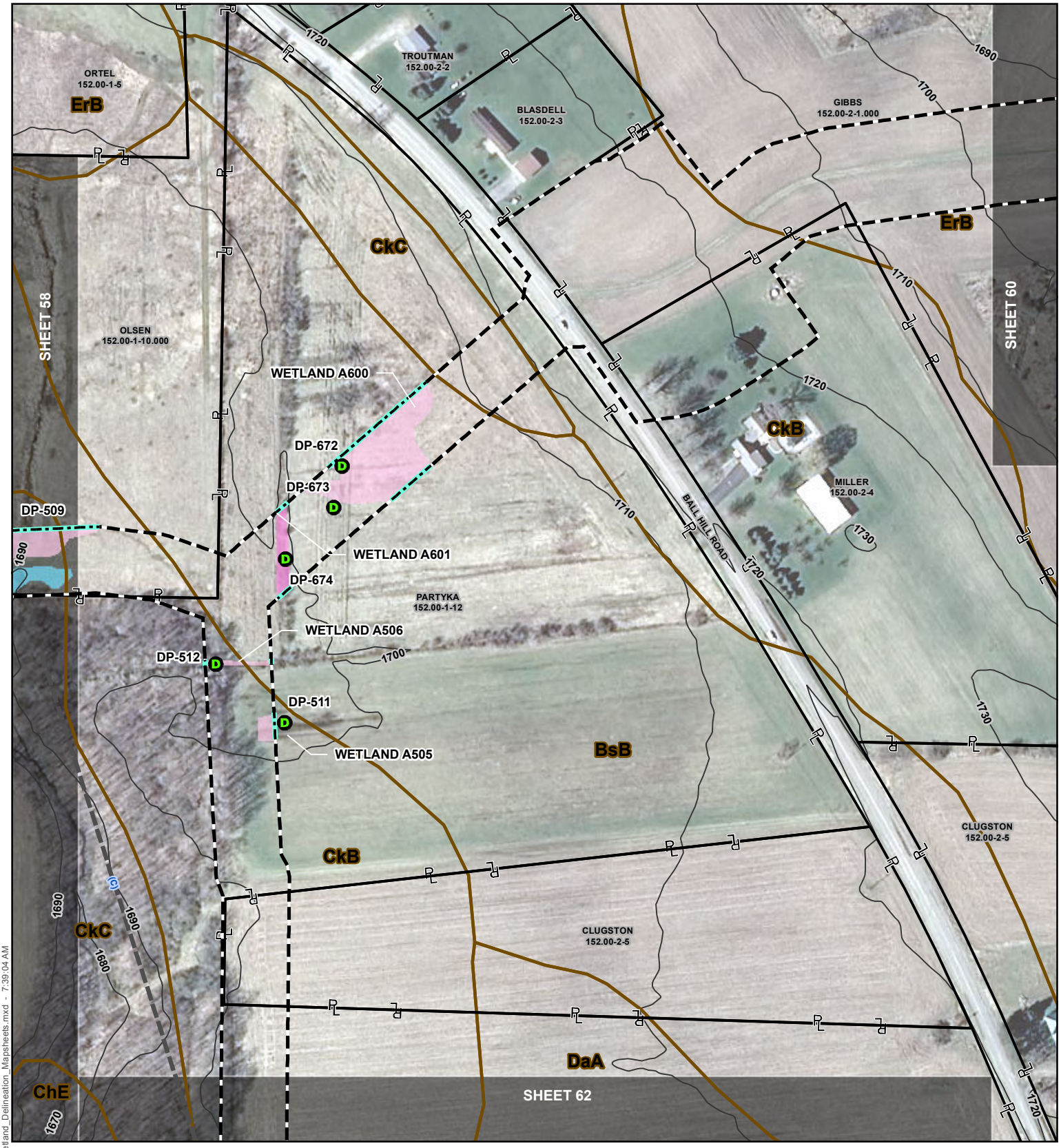

Data Point
Proposed Turbine
Culvert
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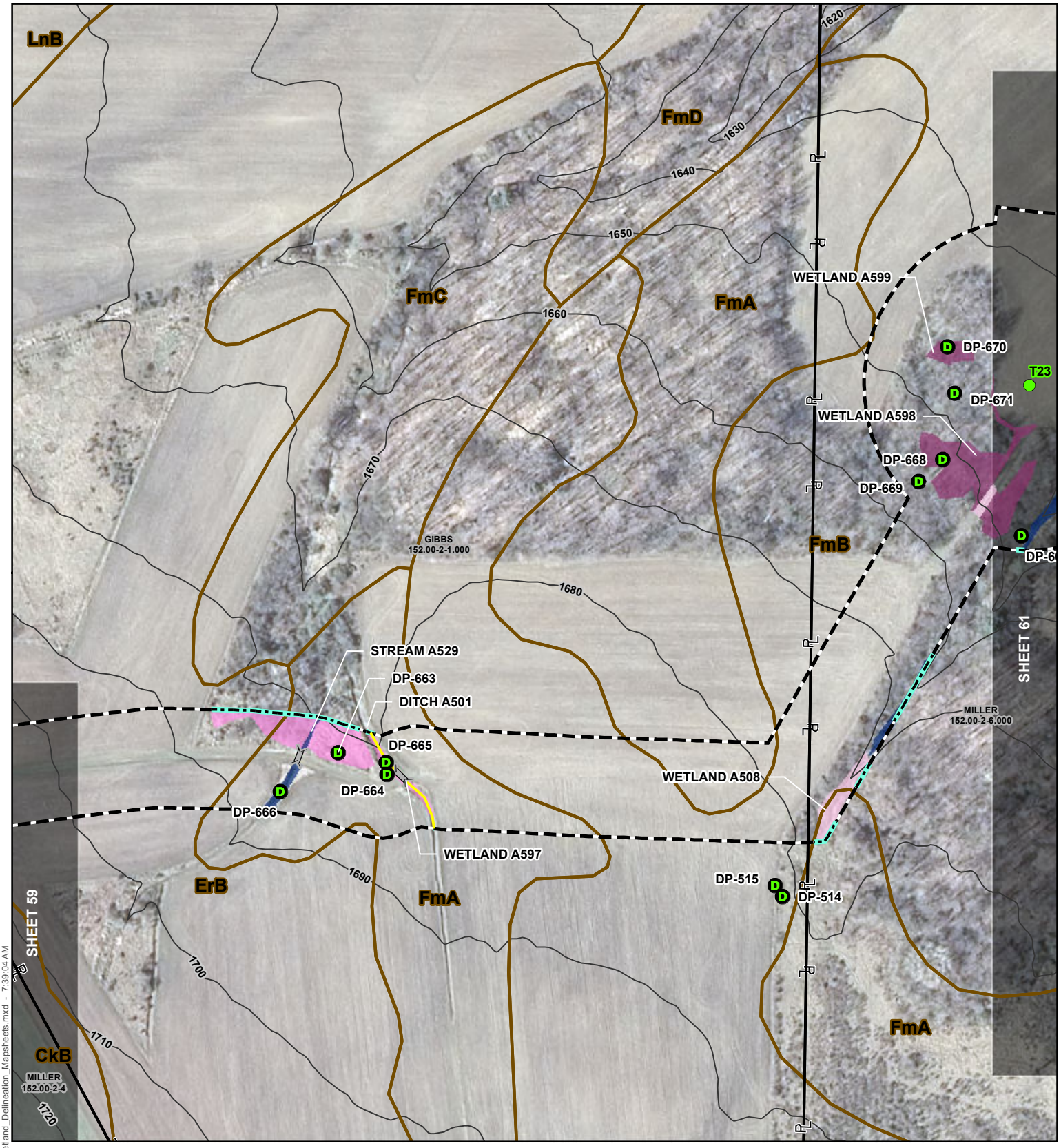

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D Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

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Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

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0 100 200 Feet

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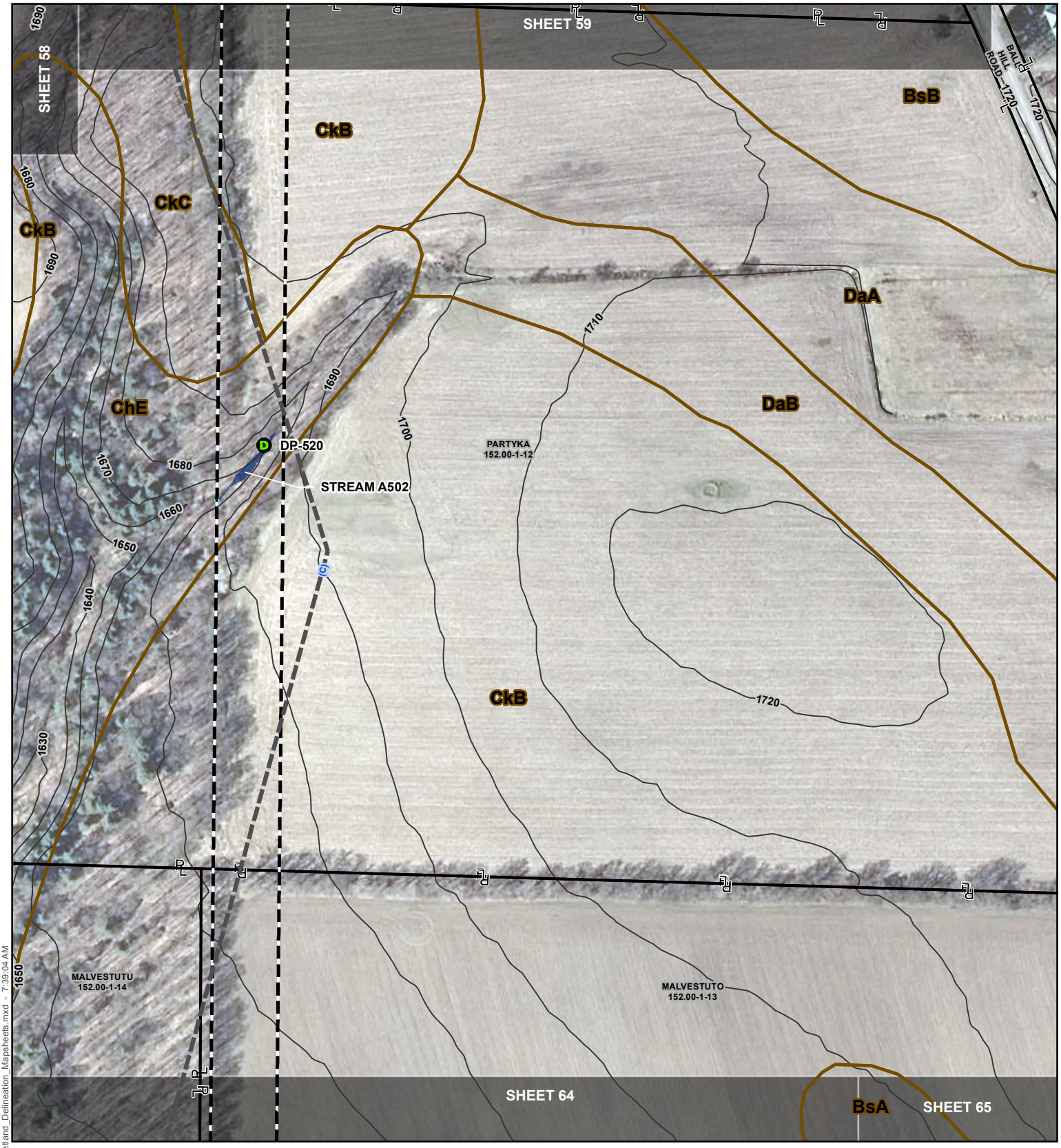

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
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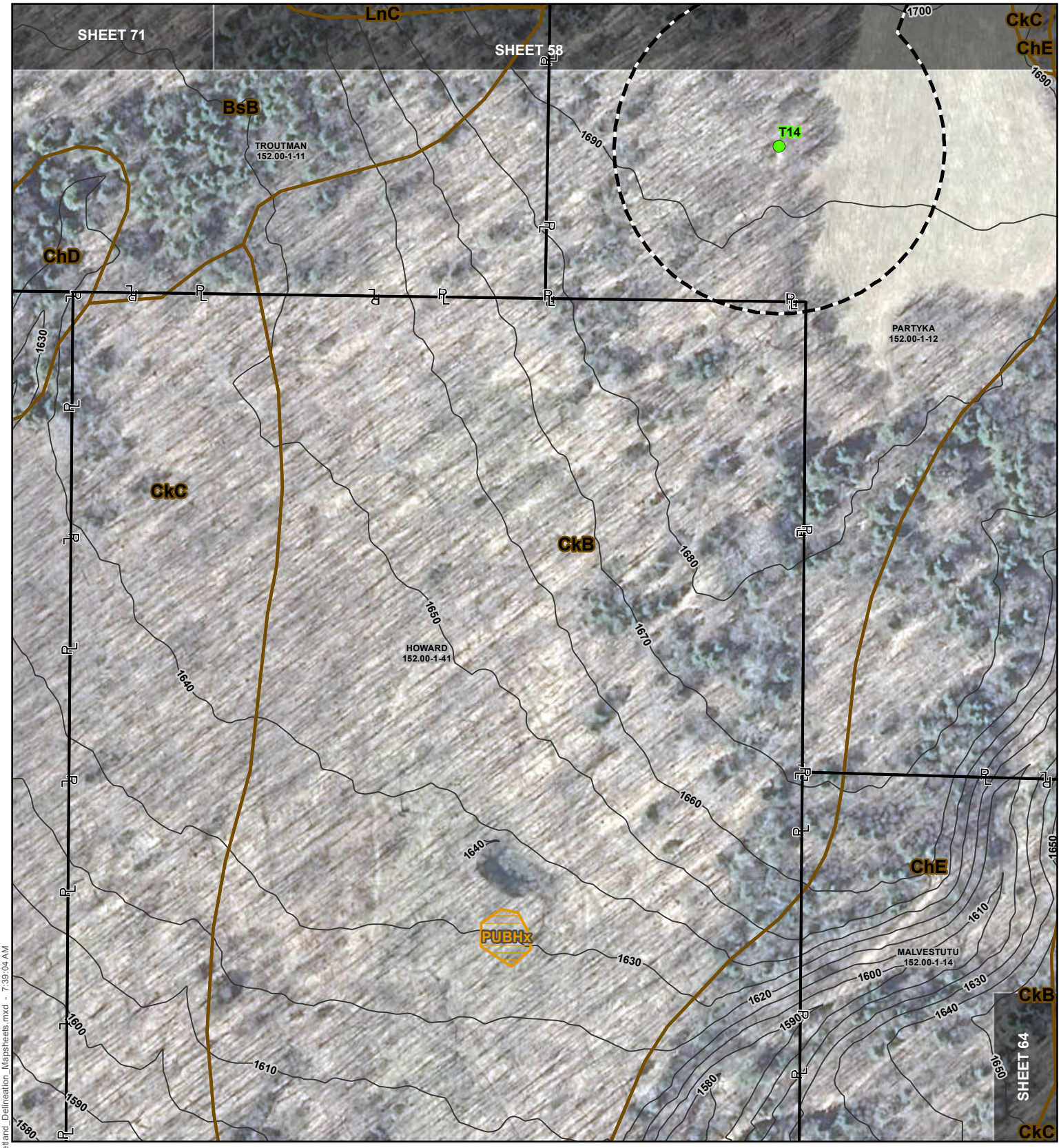

Data Point	NYSDEC Stream (Standard)	NWI Wetland
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Culvert	Delineated Intermittent Stream	Soil Complex Boundary
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Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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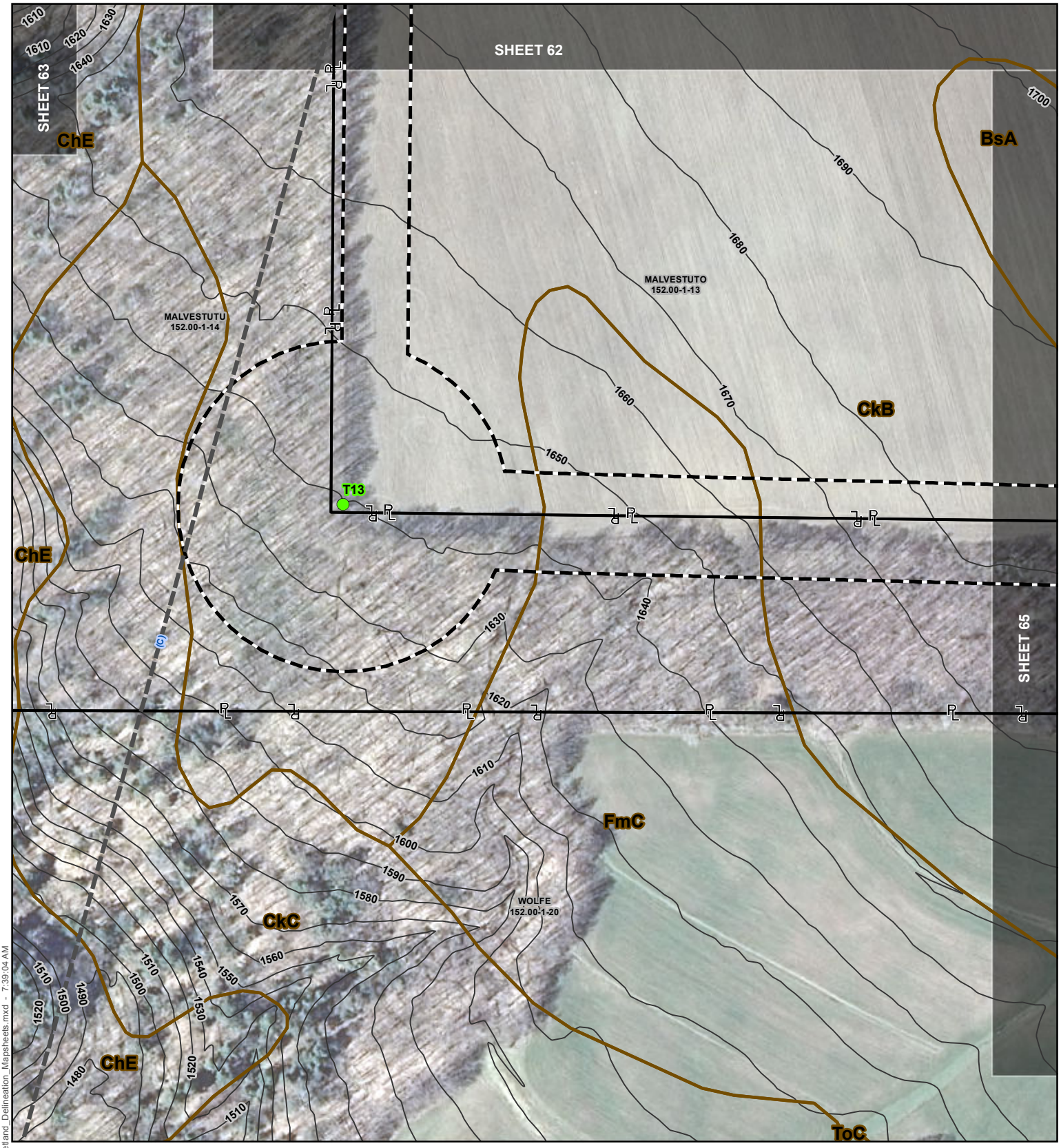

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

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NWI Wetland
NYSDEC Freshwater Wetland
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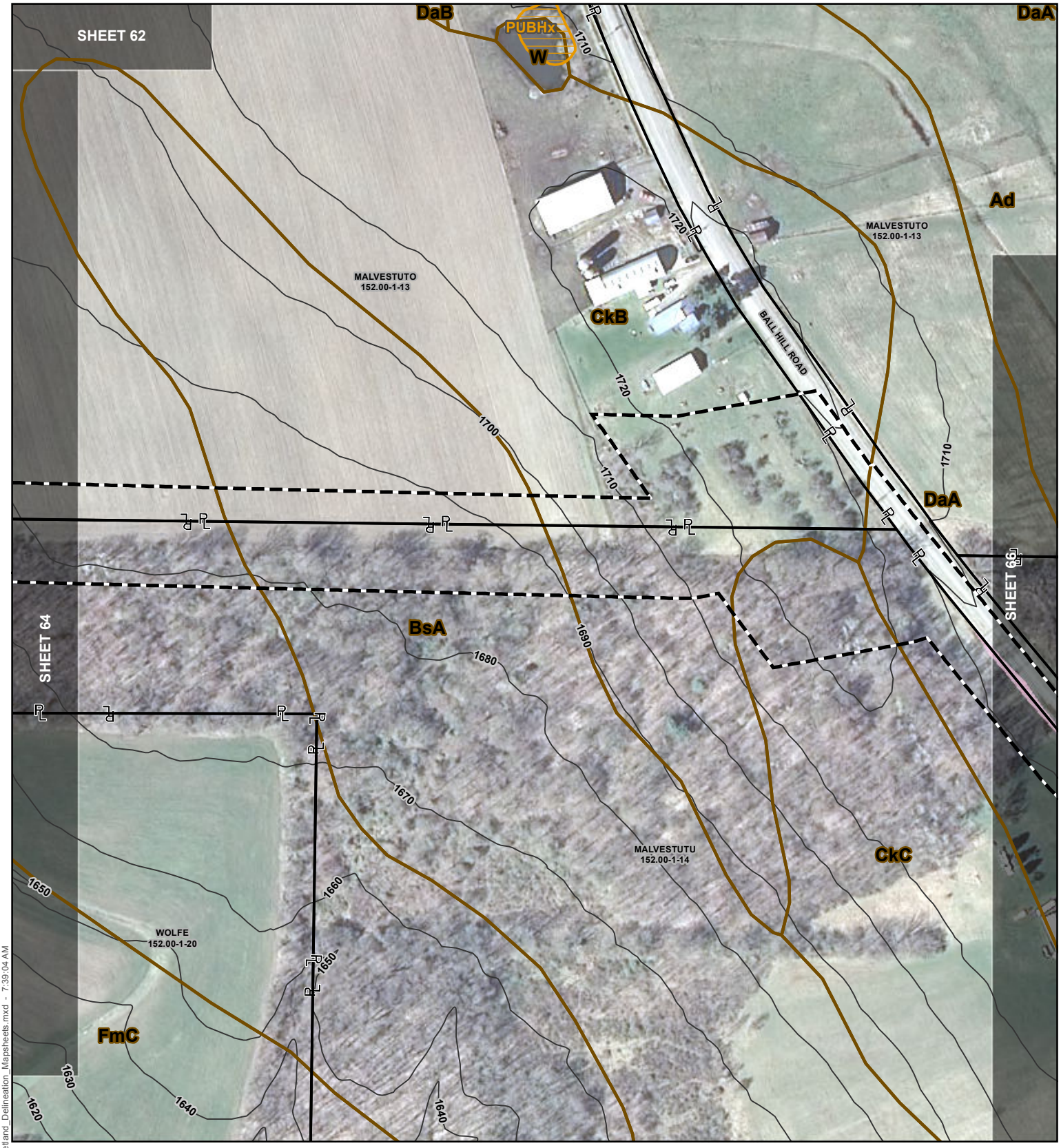

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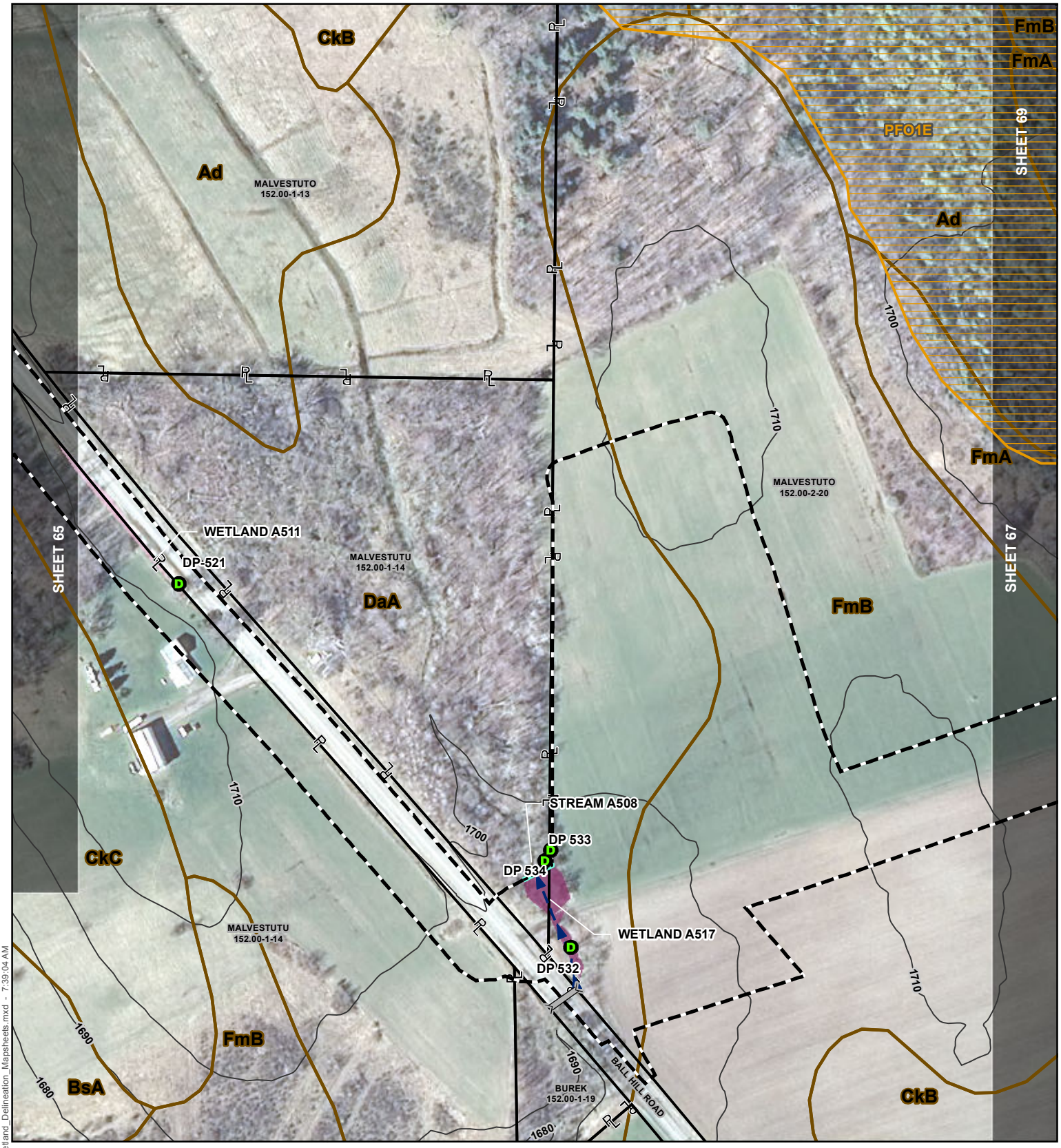

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
Delineated Jurisdictional Ditch
Delineated Ephemeral Stream
Delineated Intermittent Stream
Delineated Perennial Stream

NYSDEC Stream (Standard)
Contours (10ft)
Delineated Intermittent Stream
Delineated Perennial Stream
Delineated Pond
Delineated PEM Wetland
Delineated PFO Wetland
Delineated PSS Wetland

NWI Wetland
NYSDEC Freshwater Wetland
Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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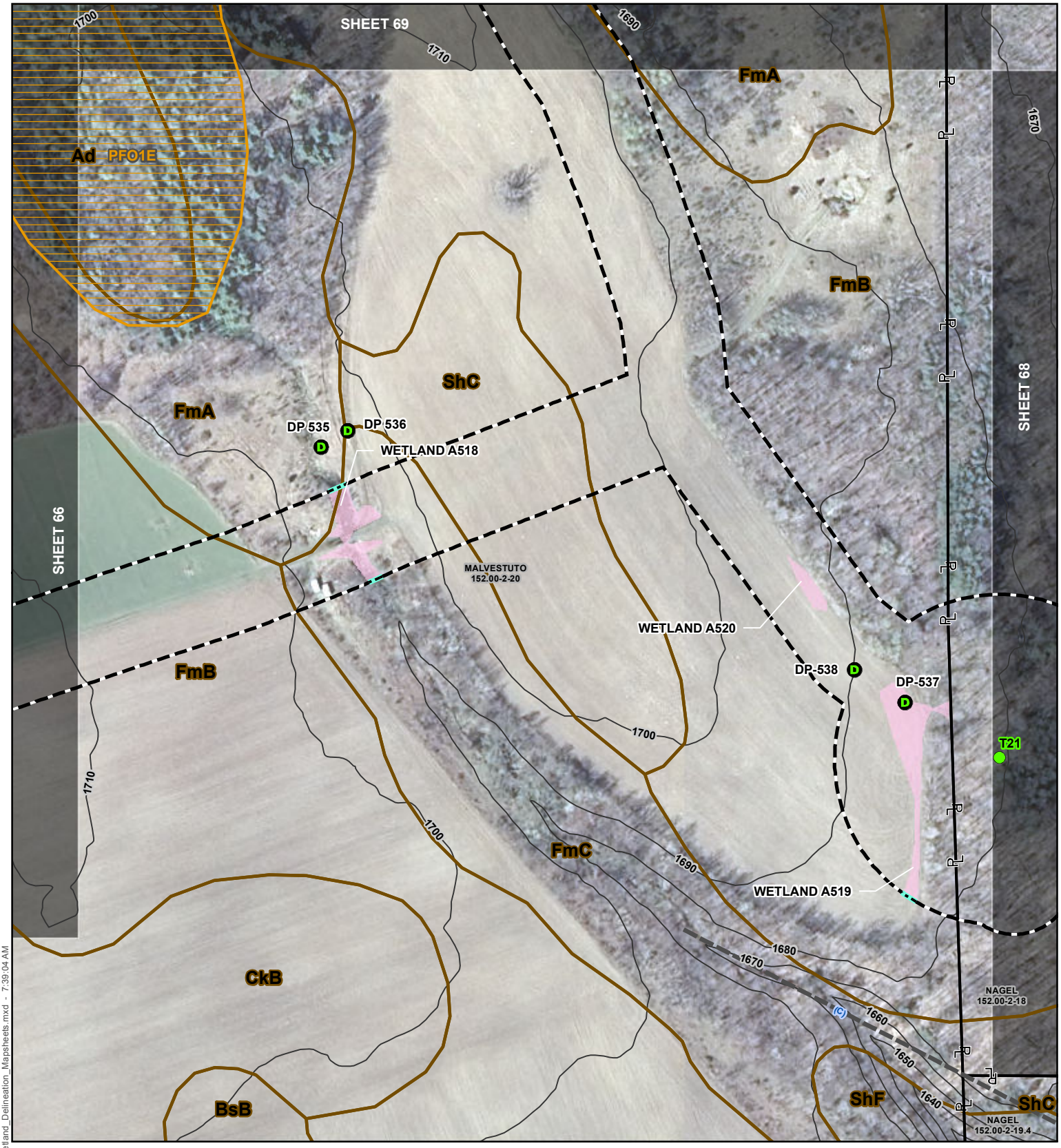

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
Delineated Ephemeral Stream	Delineated PEM Wetland	Matchline
Delineated Intermittent Stream	Delineated PFO Wetland	
Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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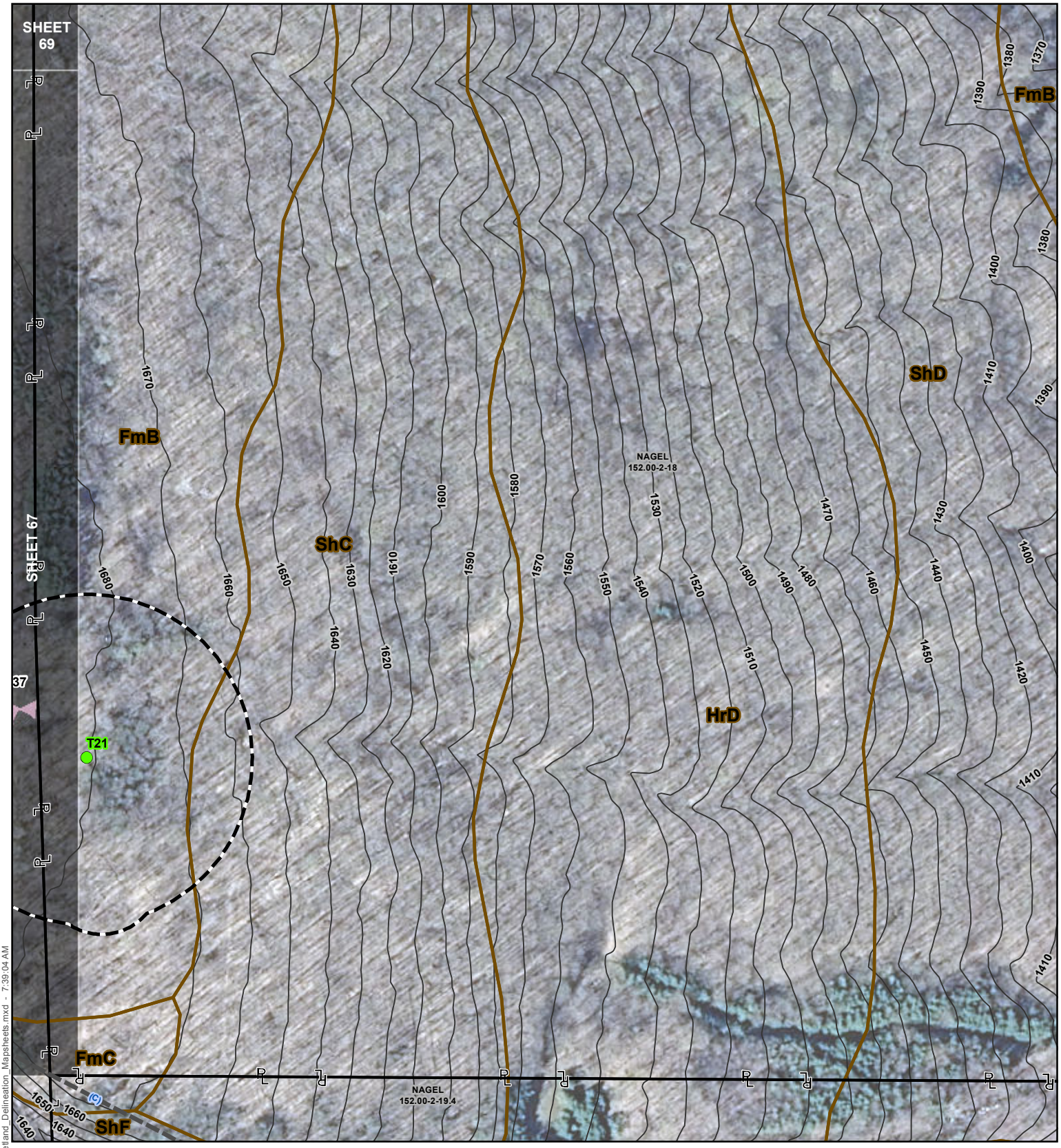

- Data Point
- Proposed Turbine
- Culvert
- Delineation Continuation Line
- Delineated Jurisdictional Ditch
- Delineated Ephemeral Stream
- Delineated Intermittent Stream
- Delineated Perennial Stream
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- Matchline

0 100 200 Feet

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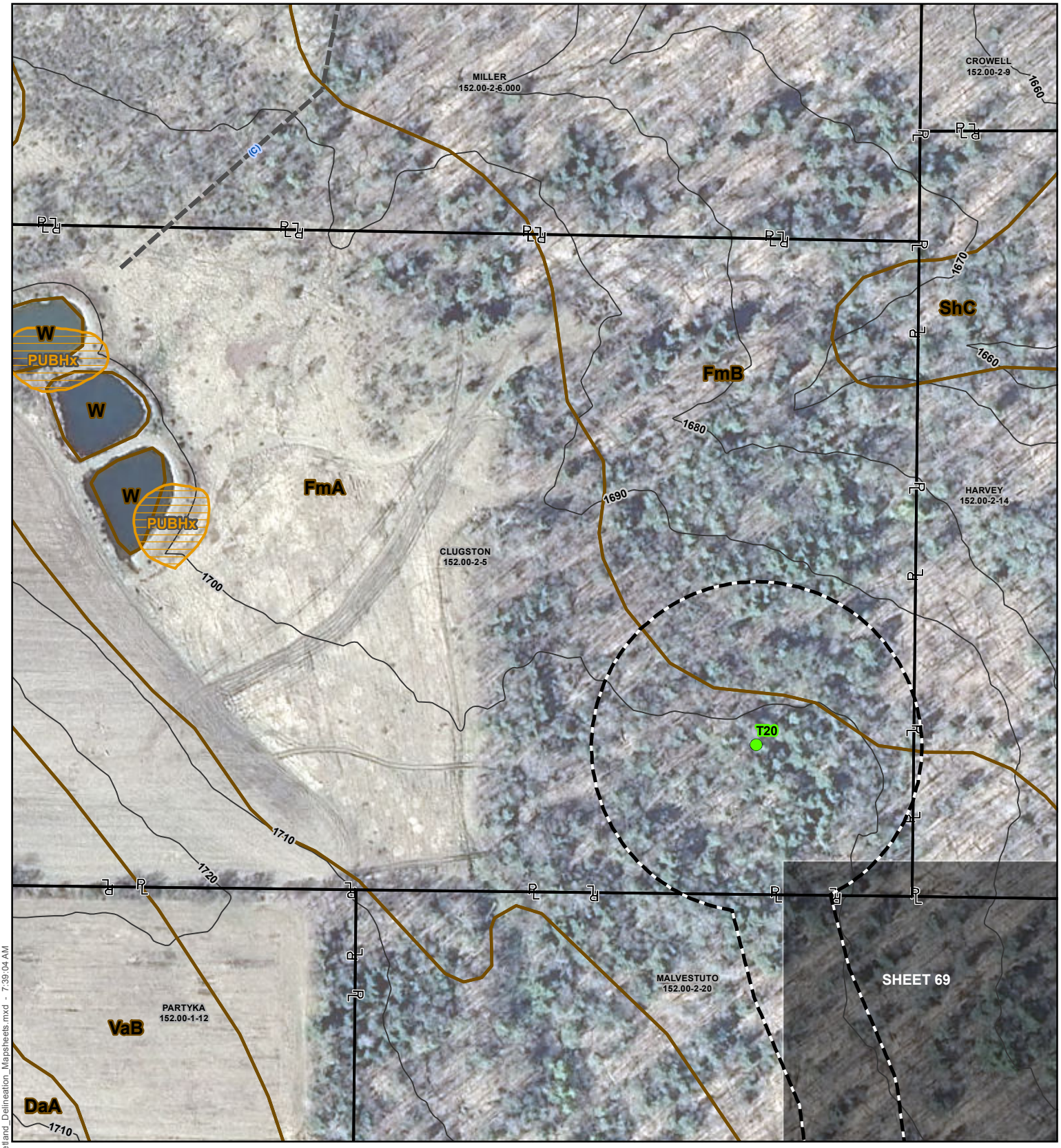

Data Point
Proposed Turbine
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0 100 200 Feet

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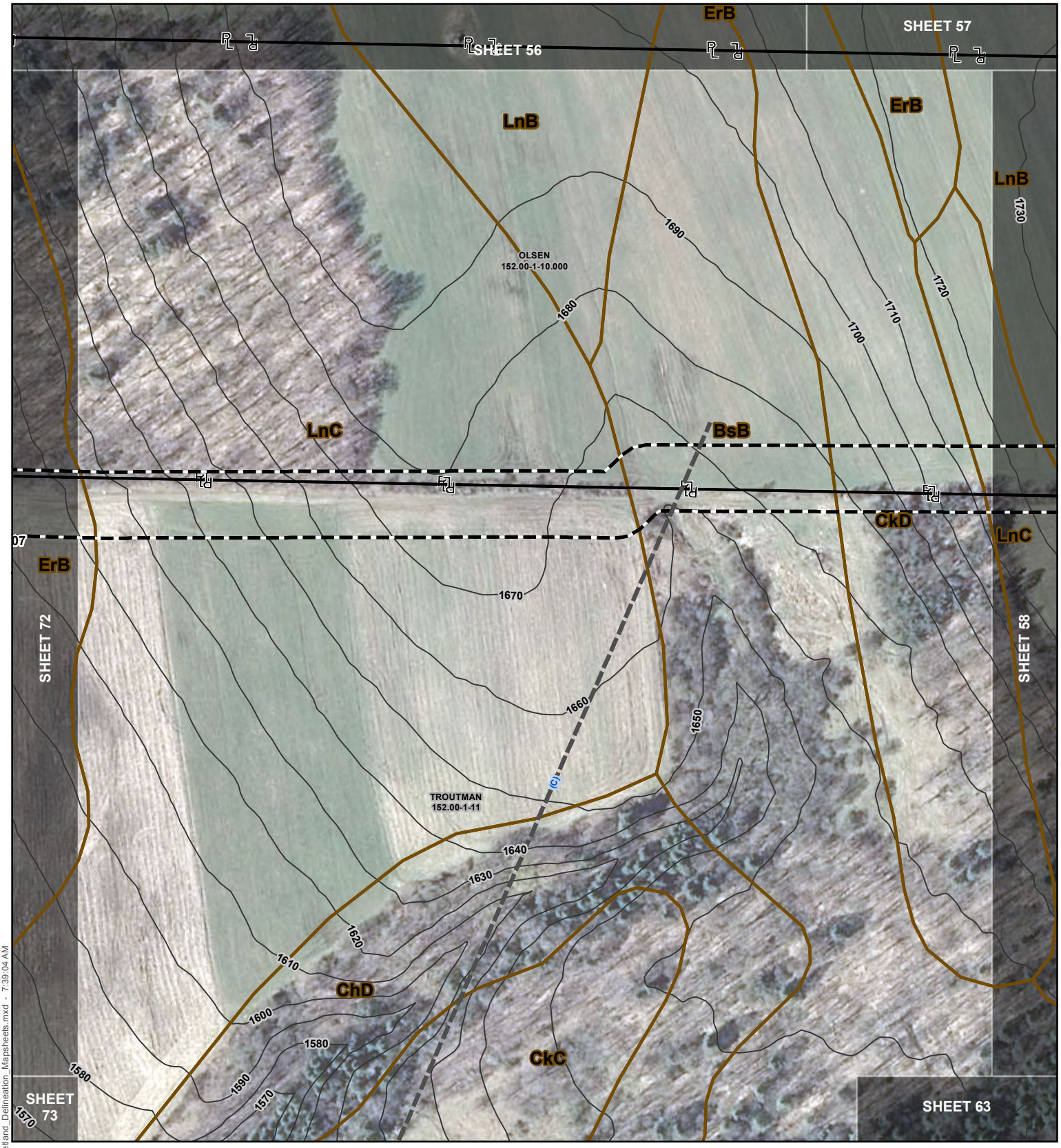

Data Point
Proposed Turbine
Culvert
Delineation Continuation Line
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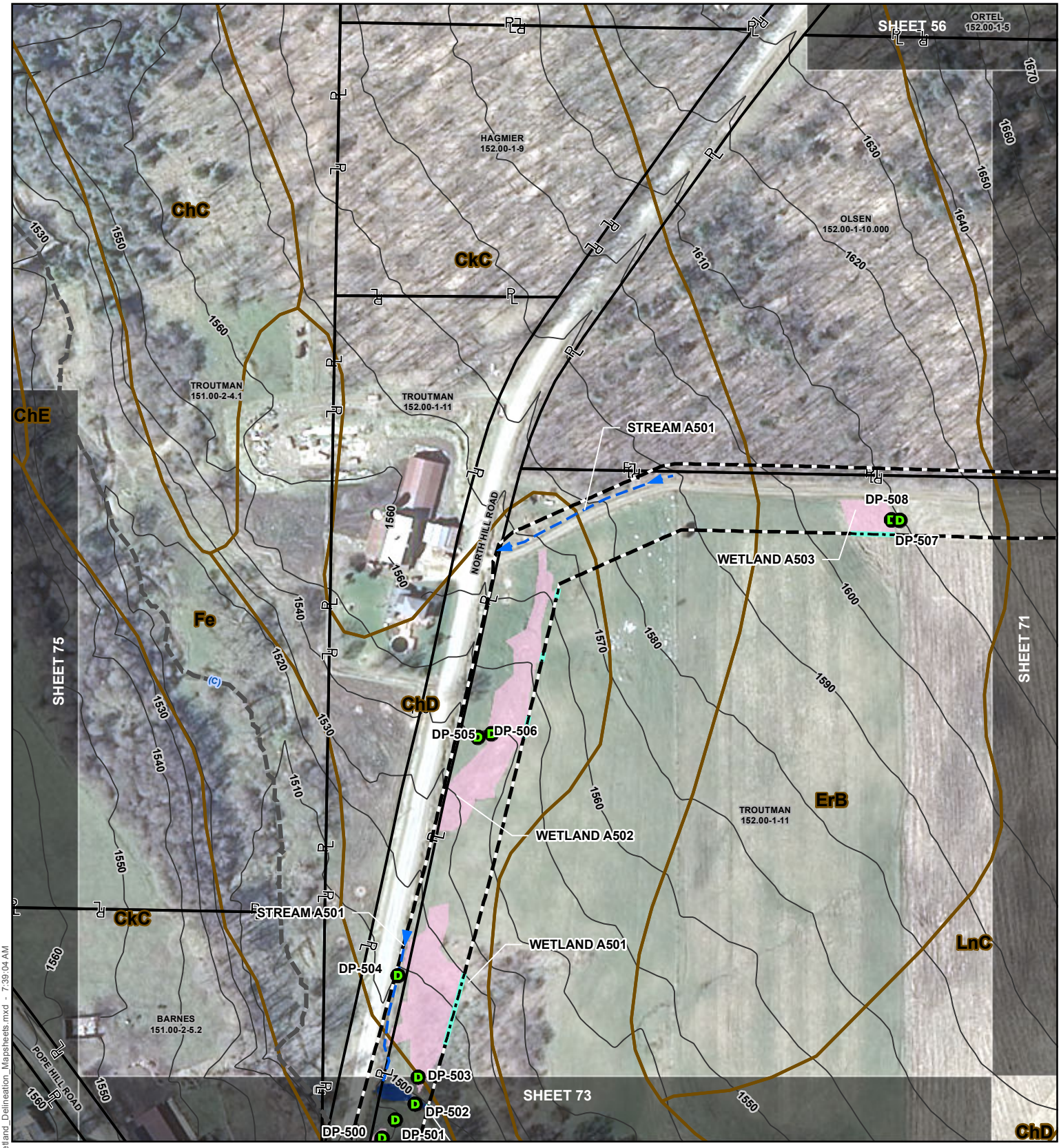

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Proposed Turbine
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0 100 200 Feet

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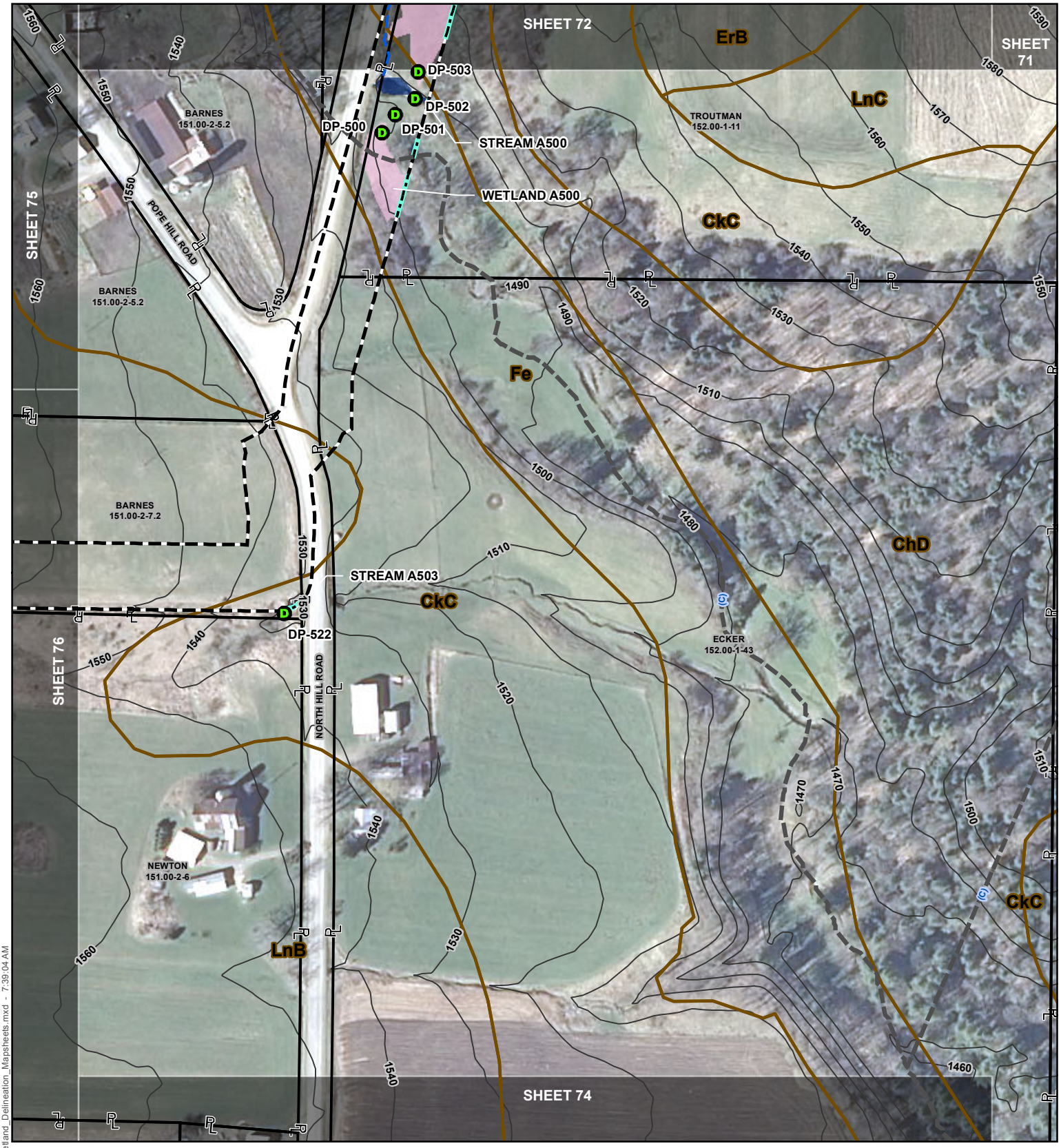

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Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
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0 100 200 Feet

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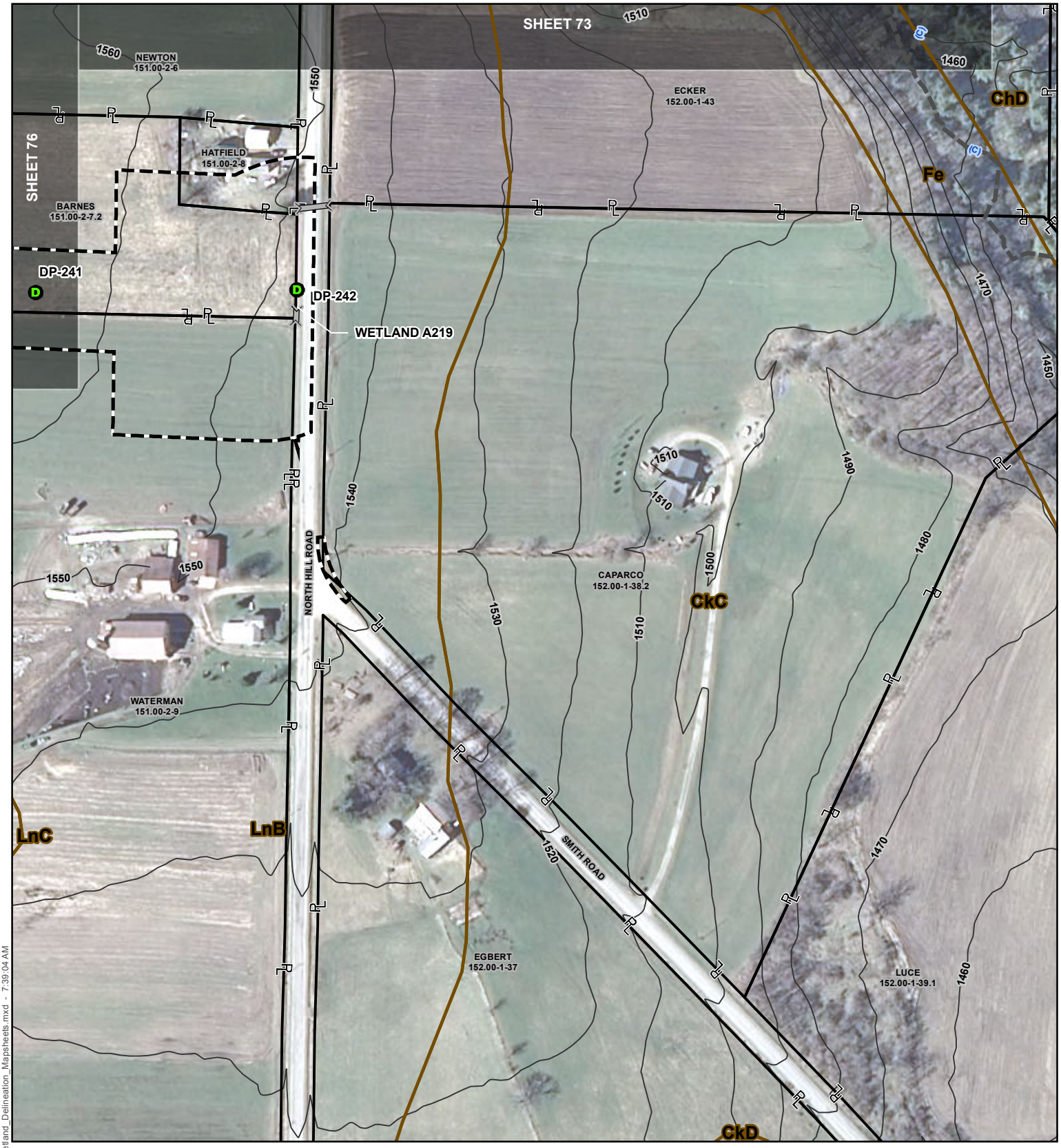

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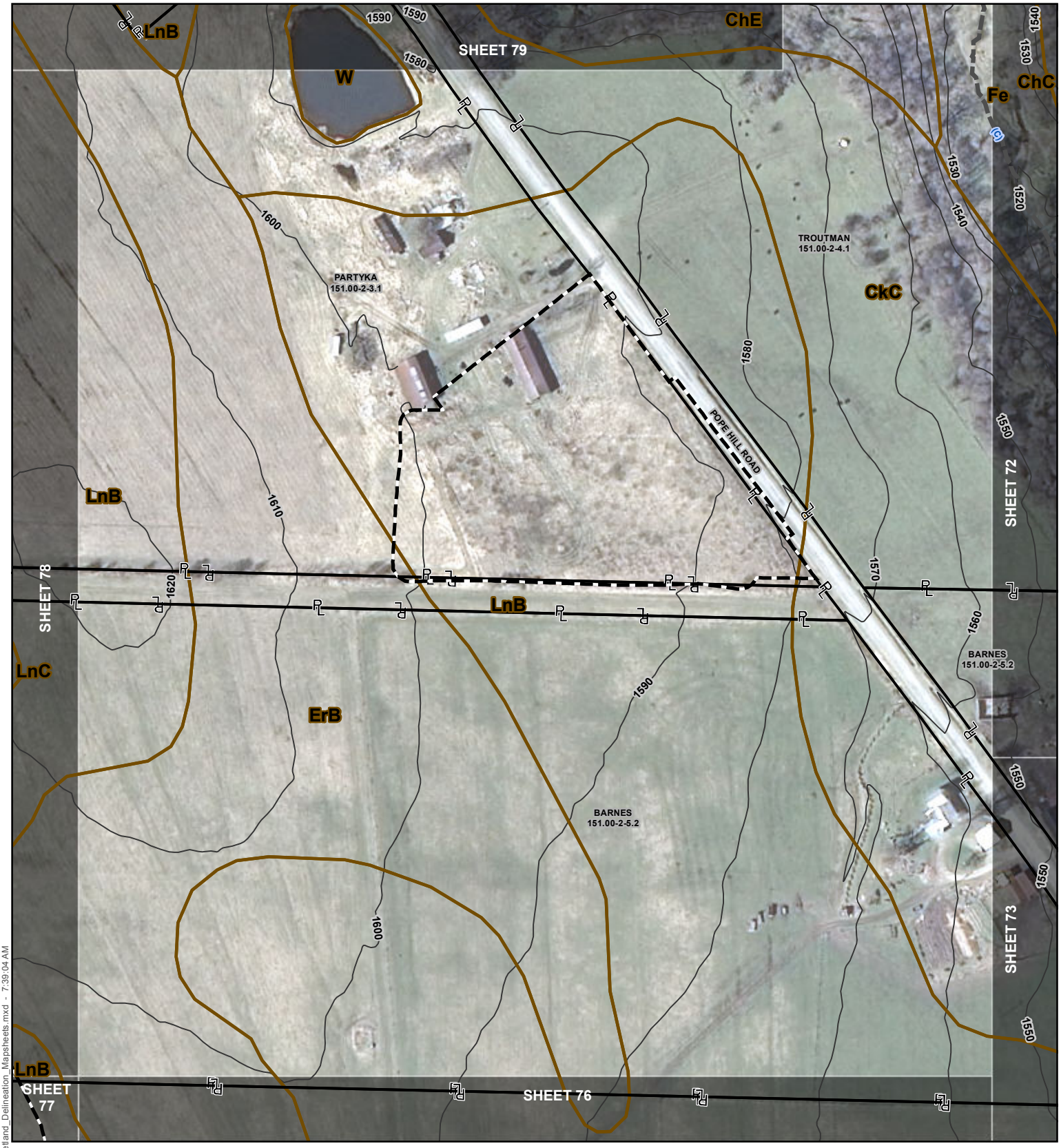

Data Point	NYSDEC Stream (Standard)	NWI Wetland
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0 100 200 Feet

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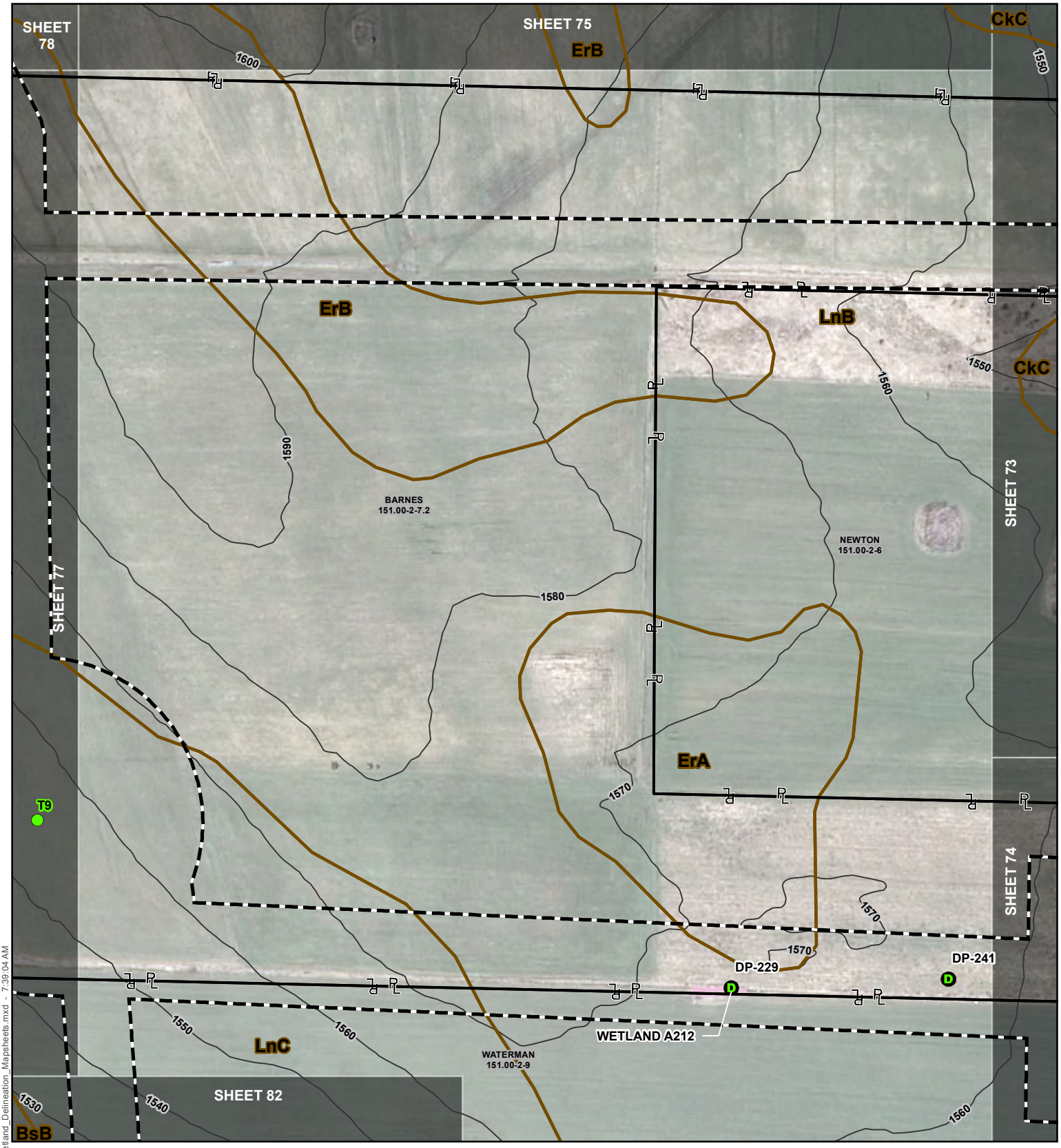

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0 100 200 Feet

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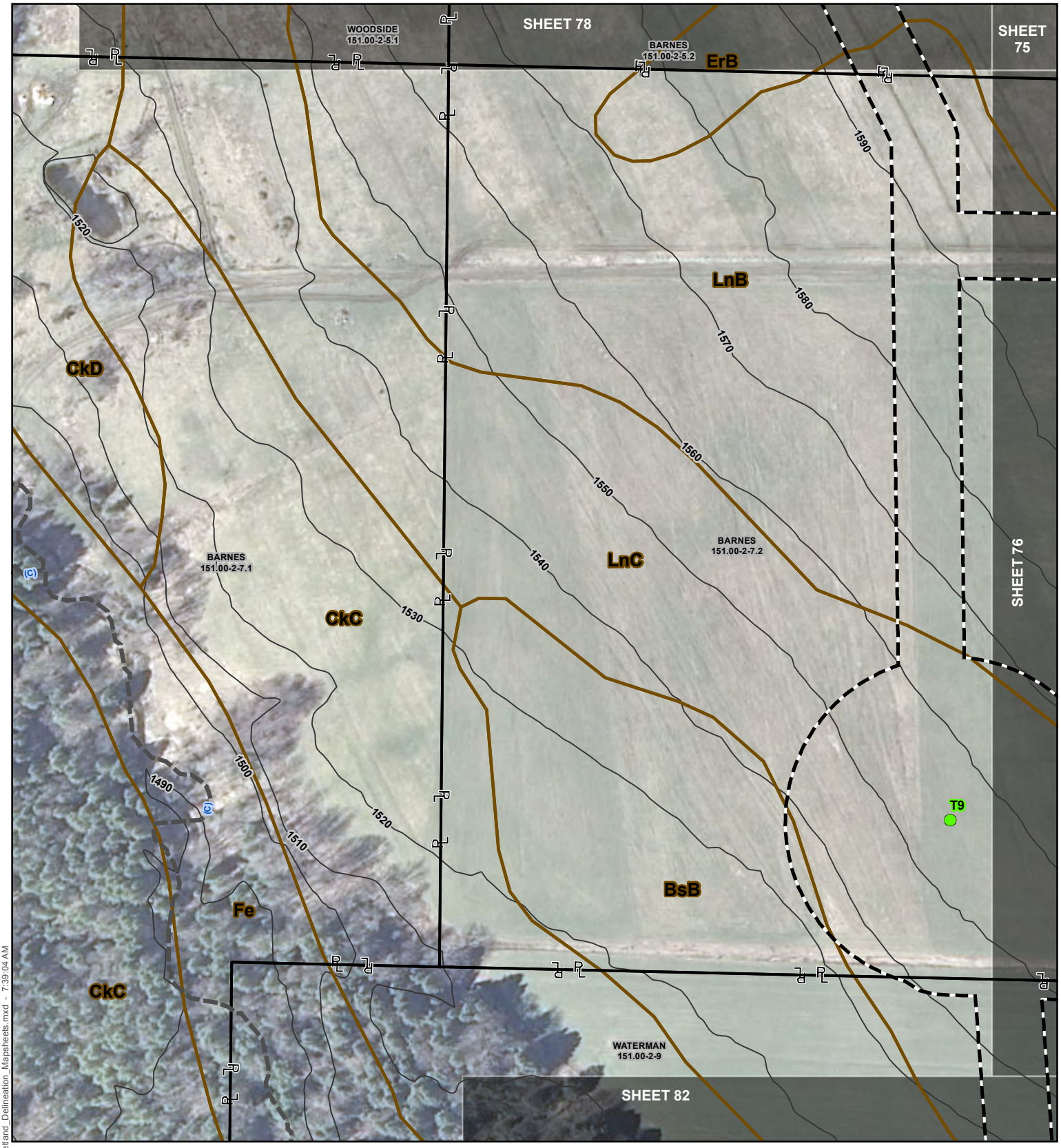

Data Point
Proposed Turbine
Culvert
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NWI Wetland
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0 100 200 Feet

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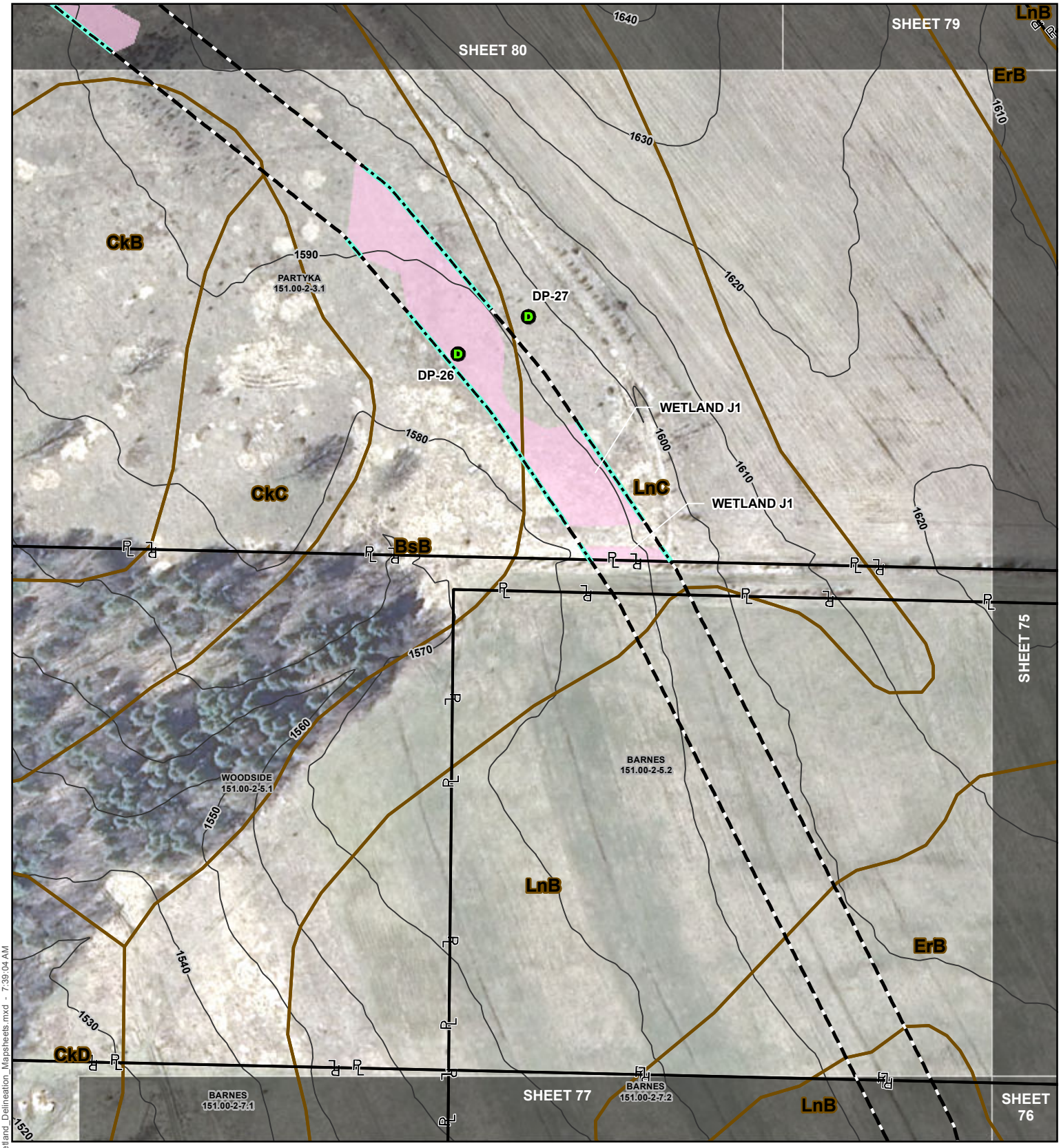

- Data Point
- Proposed Turbine
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0 100 200 Feet

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Data Point
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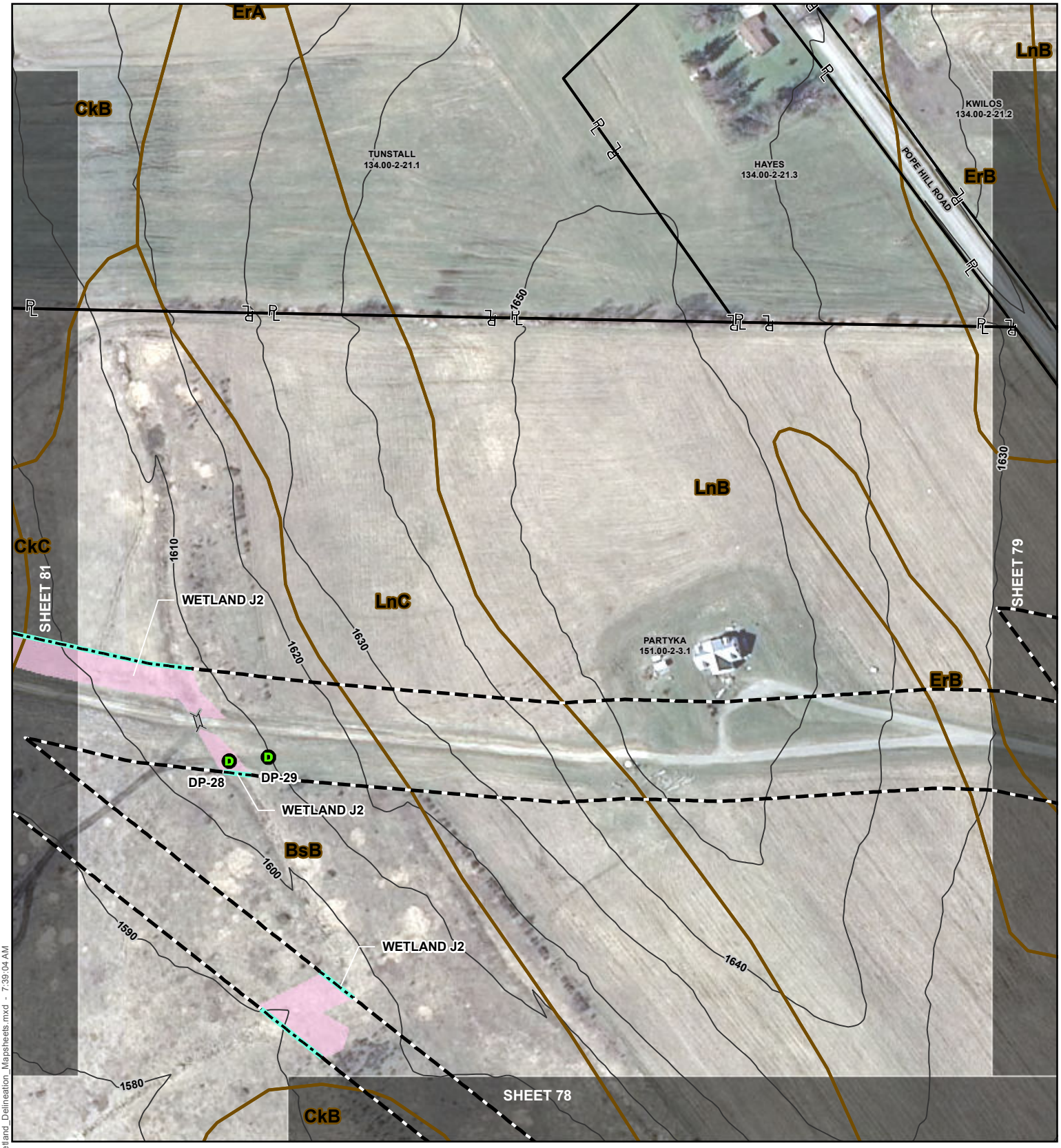

Data Point
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NWI Wetland
NYSDEC Freshwater Wetland
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Project Study Limits
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0 100 200 Feet

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Data Point
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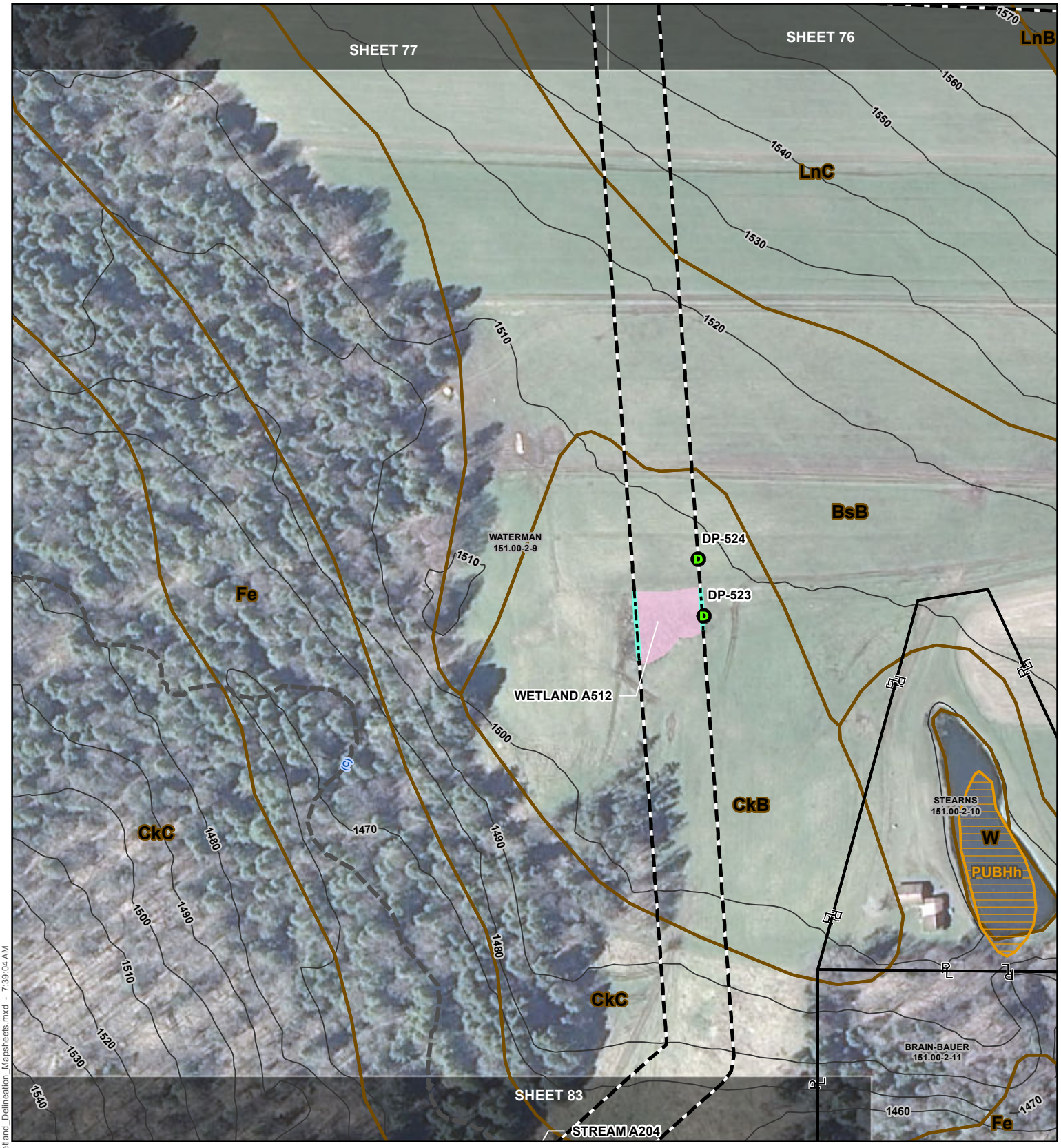

Data Point	NYSDEC Stream (Standard)	NWI Wetland
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Culvert	Delineated Intermittent Stream	Soil Complex Boundary
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0 100 200 Feet

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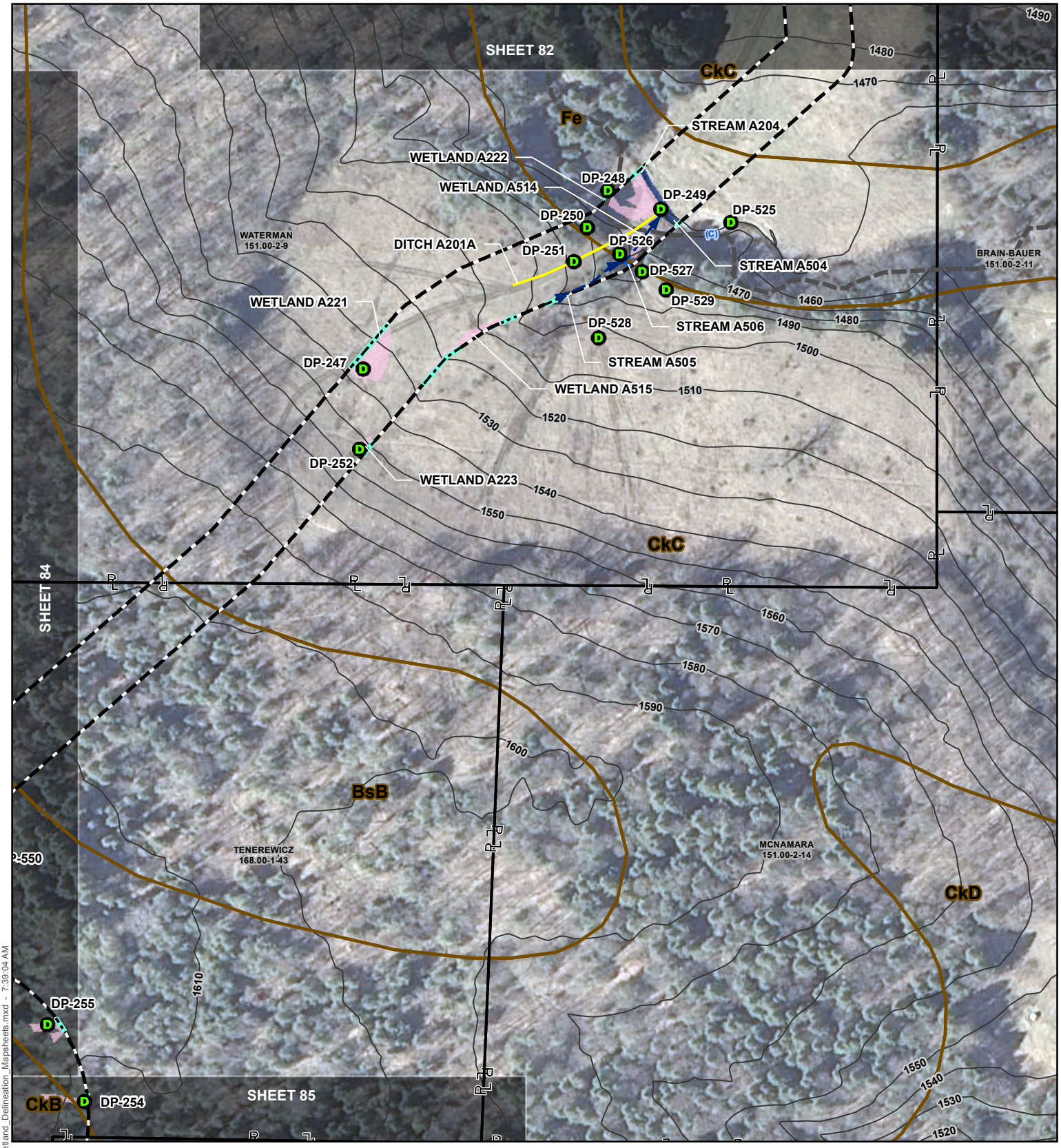

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Data Point	NYSDEC Stream (Standard)	NWI Wetland
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Culvert	Delineated Intermittent Stream	Soil Complex Boundary
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Delineated Perennial Stream	Delineated PSS Wetland	

0 100 200 Feet

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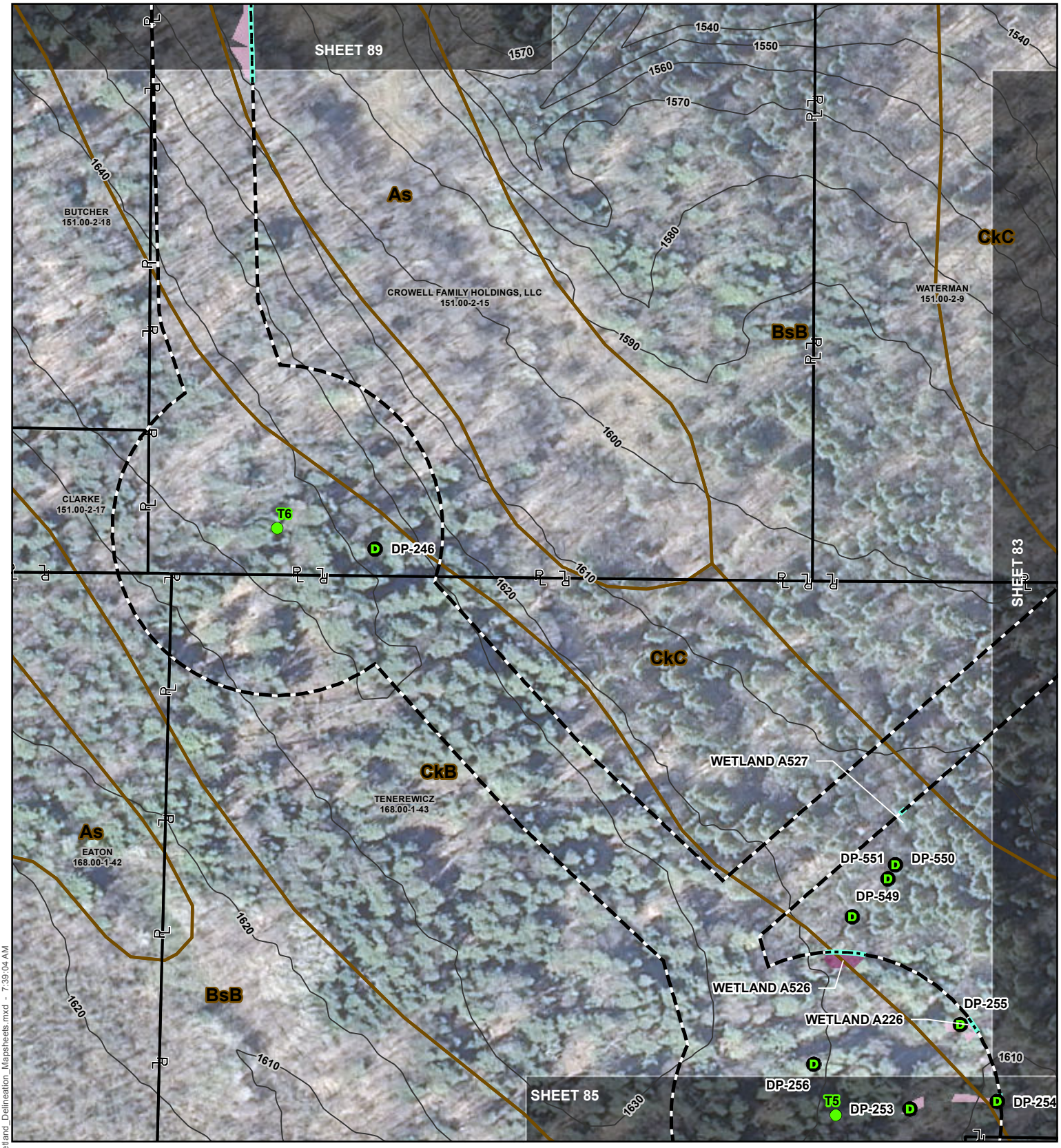

Data Point	NYSDEC Stream (Standard)	NWI Wetland
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0 100 200 Feet

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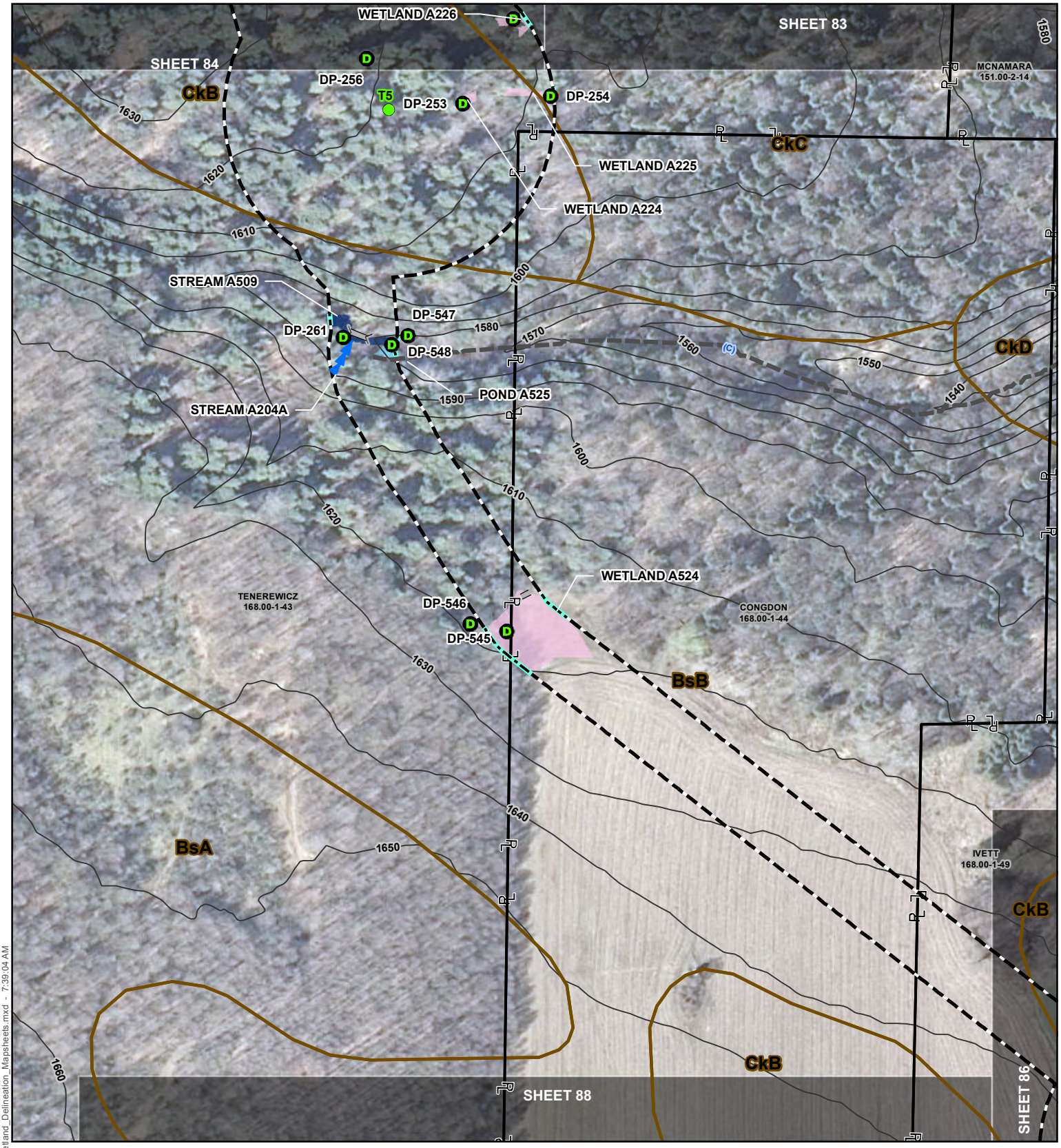

Data Point
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Soil Complex Boundary
Parcel
Project Study Limits
Matchline

0 100 200 Feet

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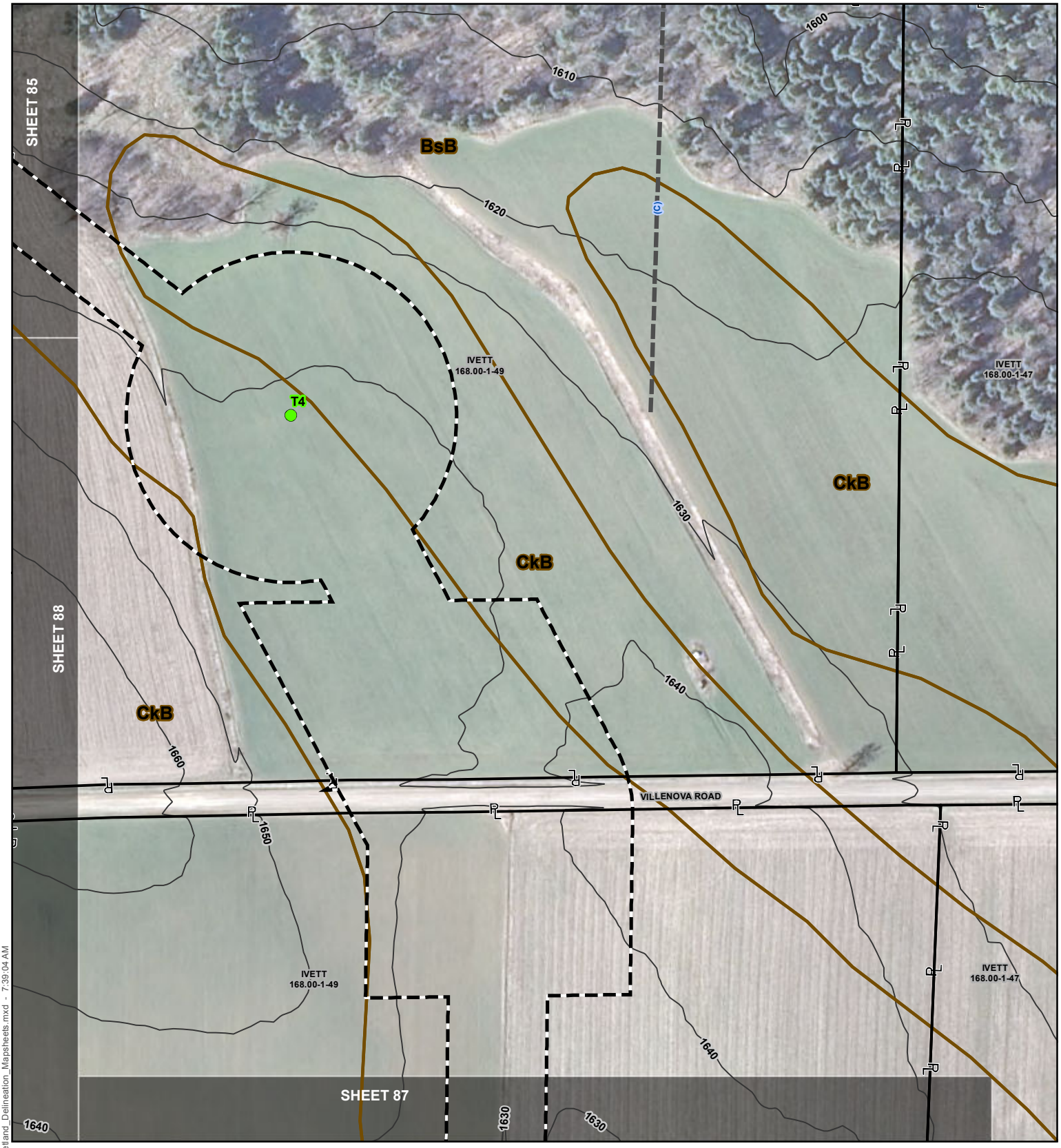

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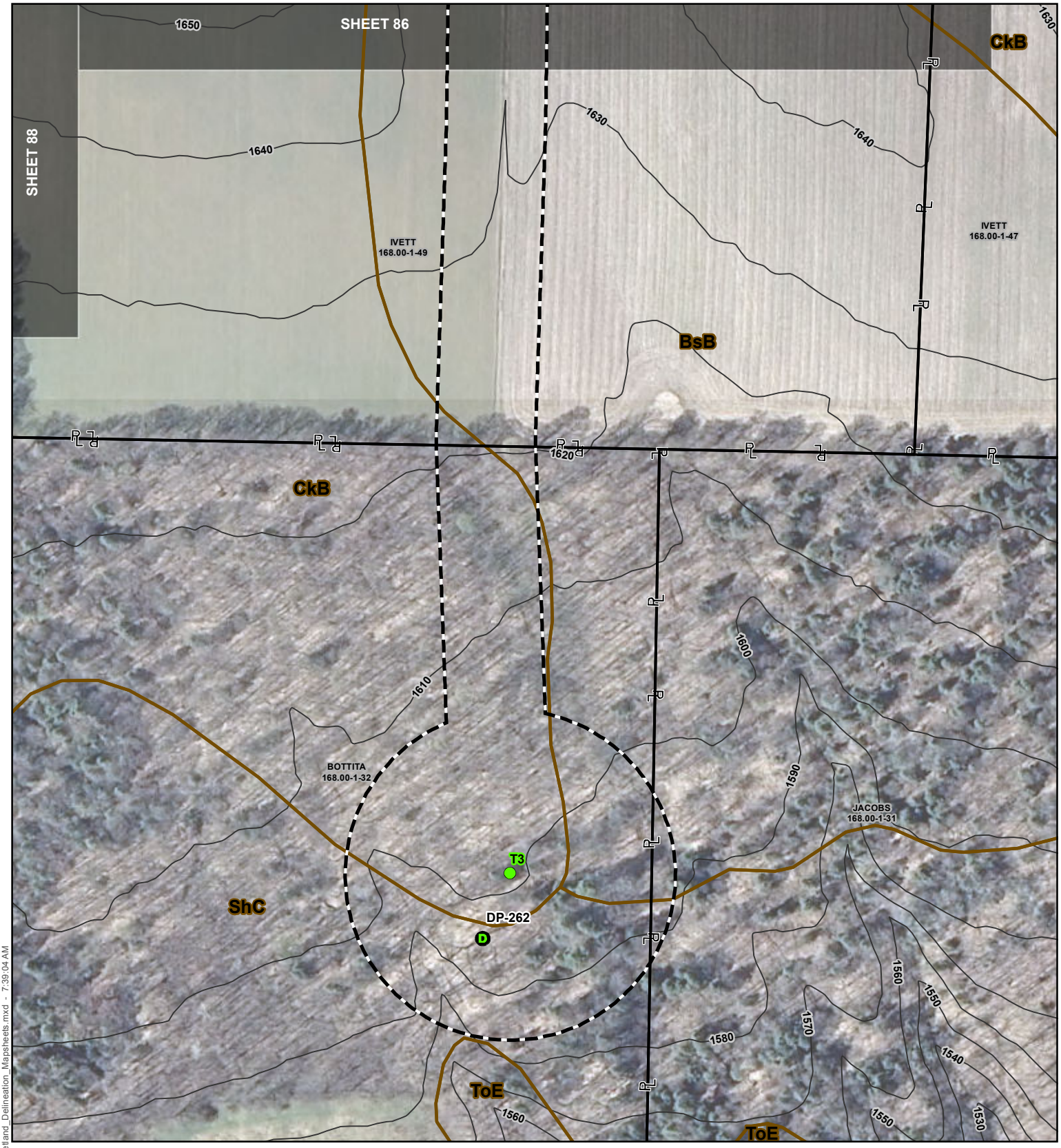

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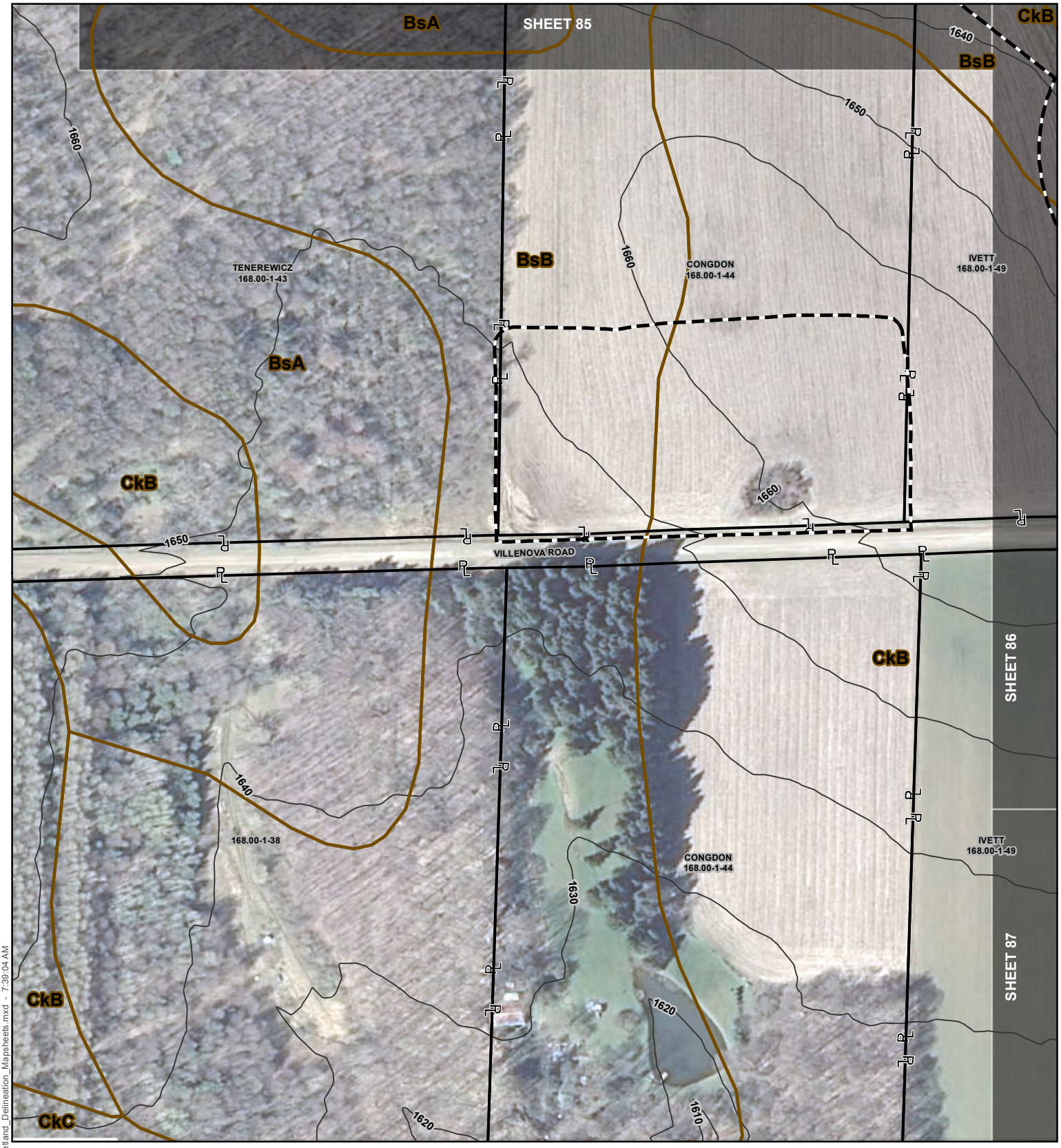

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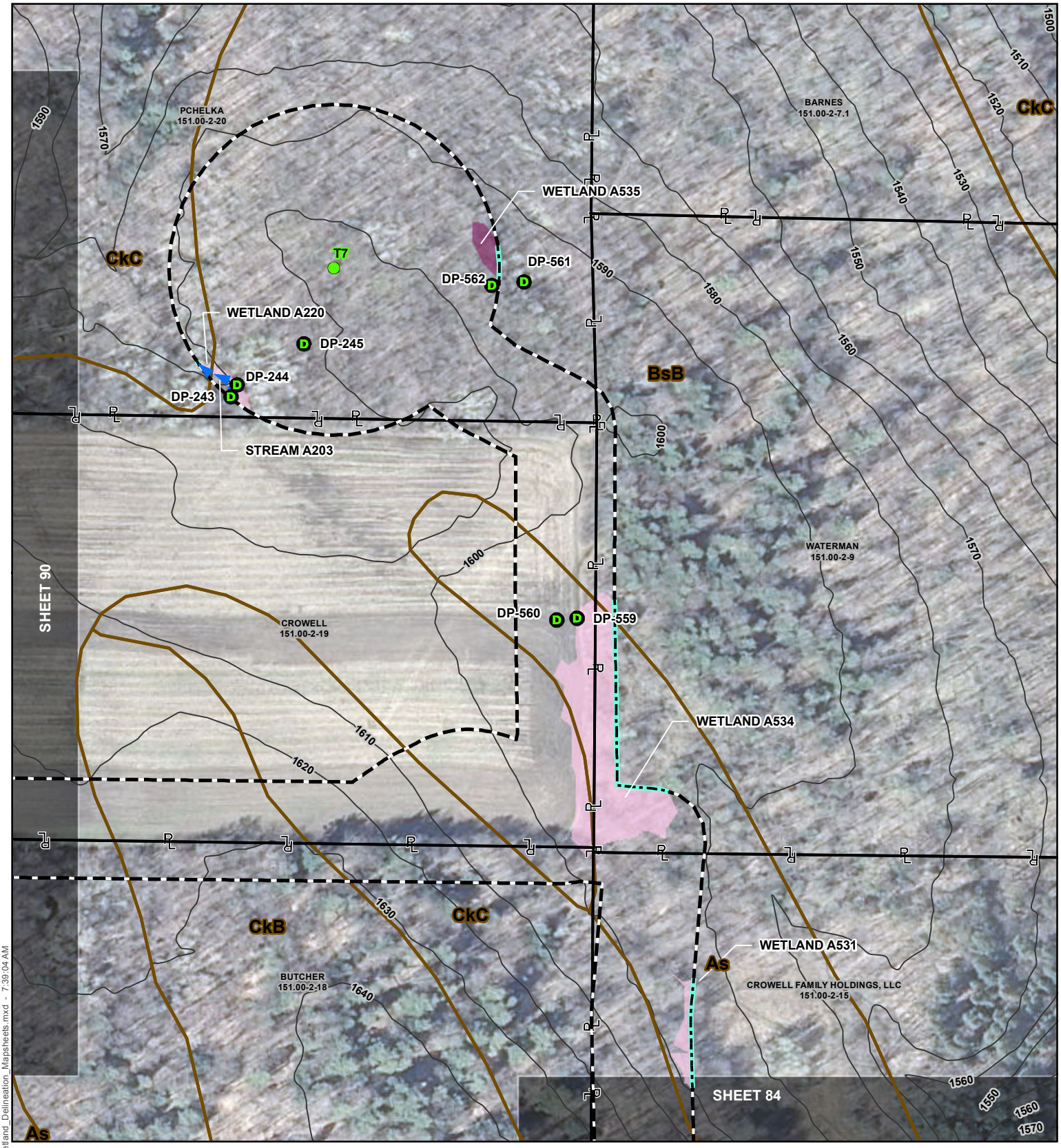

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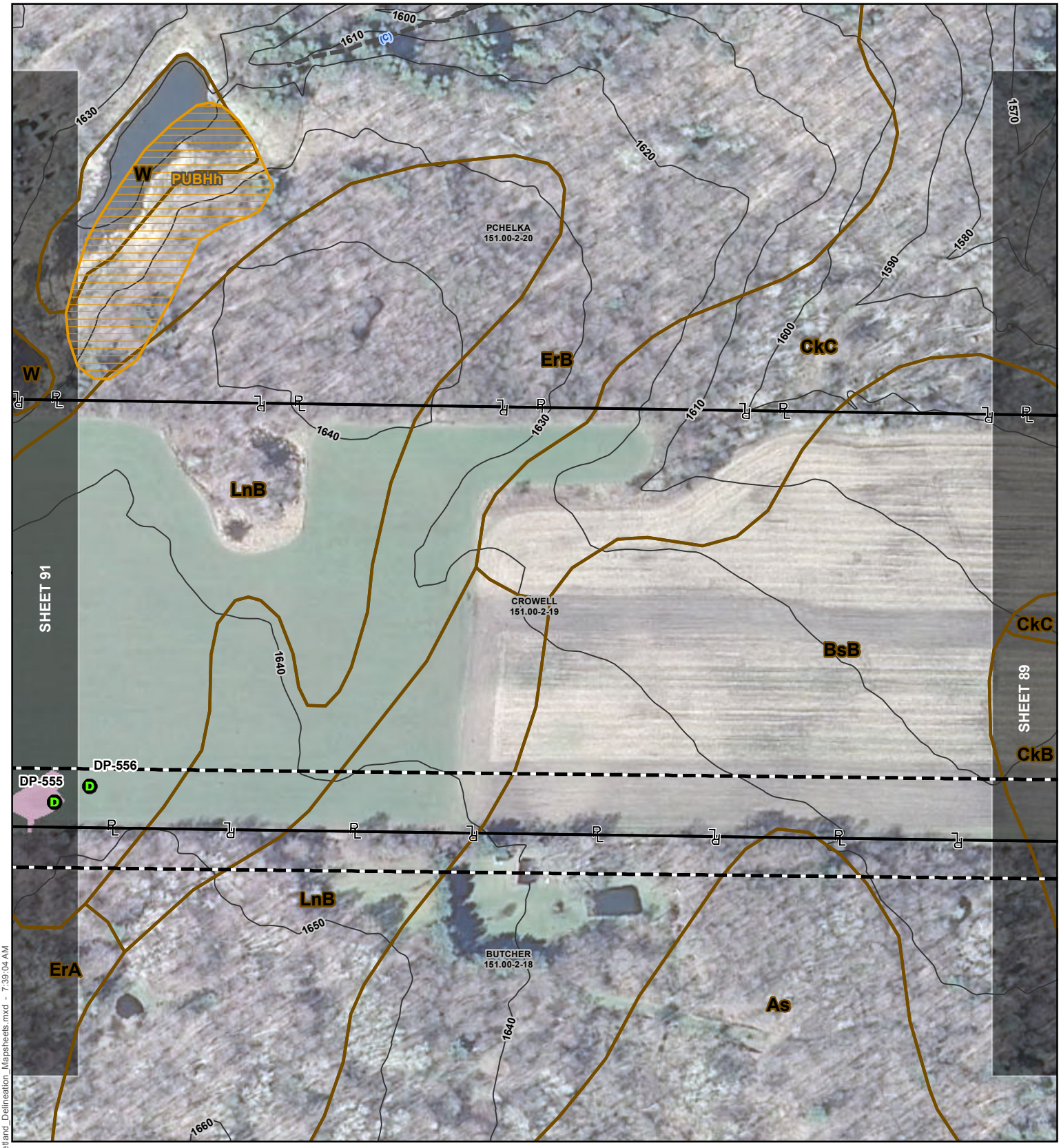

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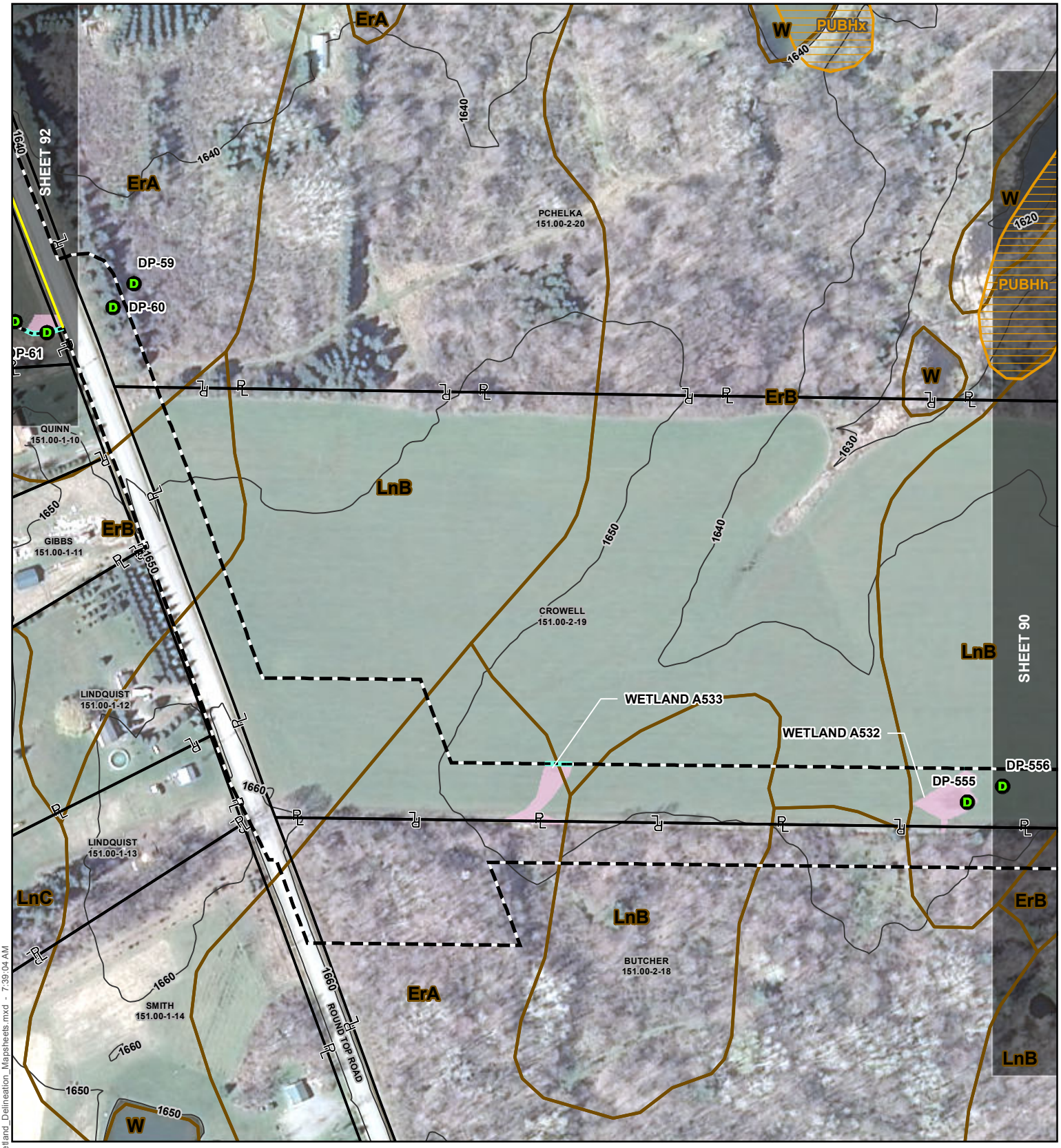

Data Point	NYSDEC Stream (Standard)	NWI Wetland
Proposed Turbine	Contours (10ft)	NYSDEC Freshwater Wetland
Culvert	Delineated Intermittent Stream	Soil Complex Boundary
Delineation Continuation Line	Delineated Perennial Stream	Parcel
Delineated Jurisdictional Ditch	Delineated Pond	Project Study Limits
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Delineated Perennial Stream	Delineated PSS Wetland	

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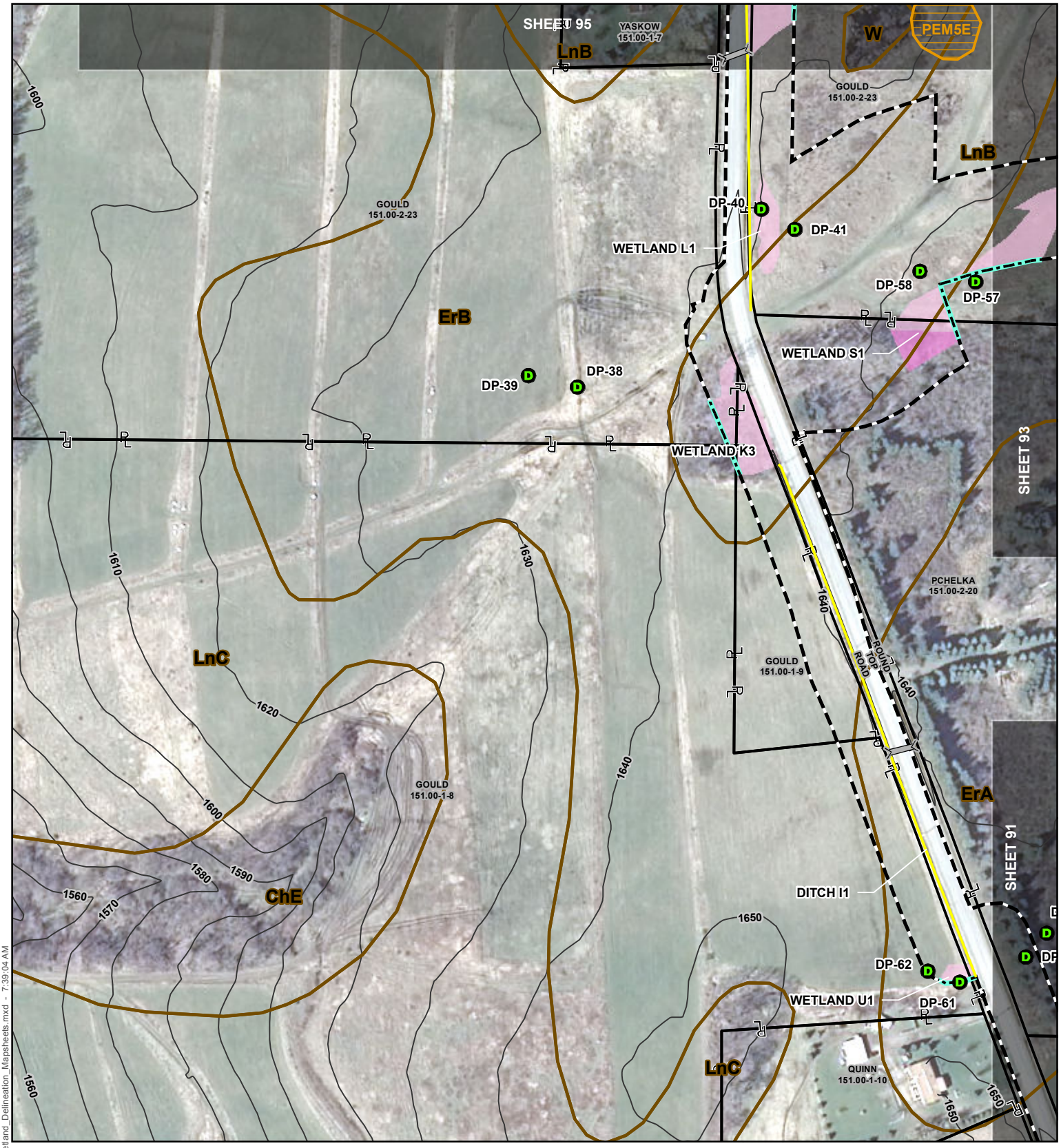

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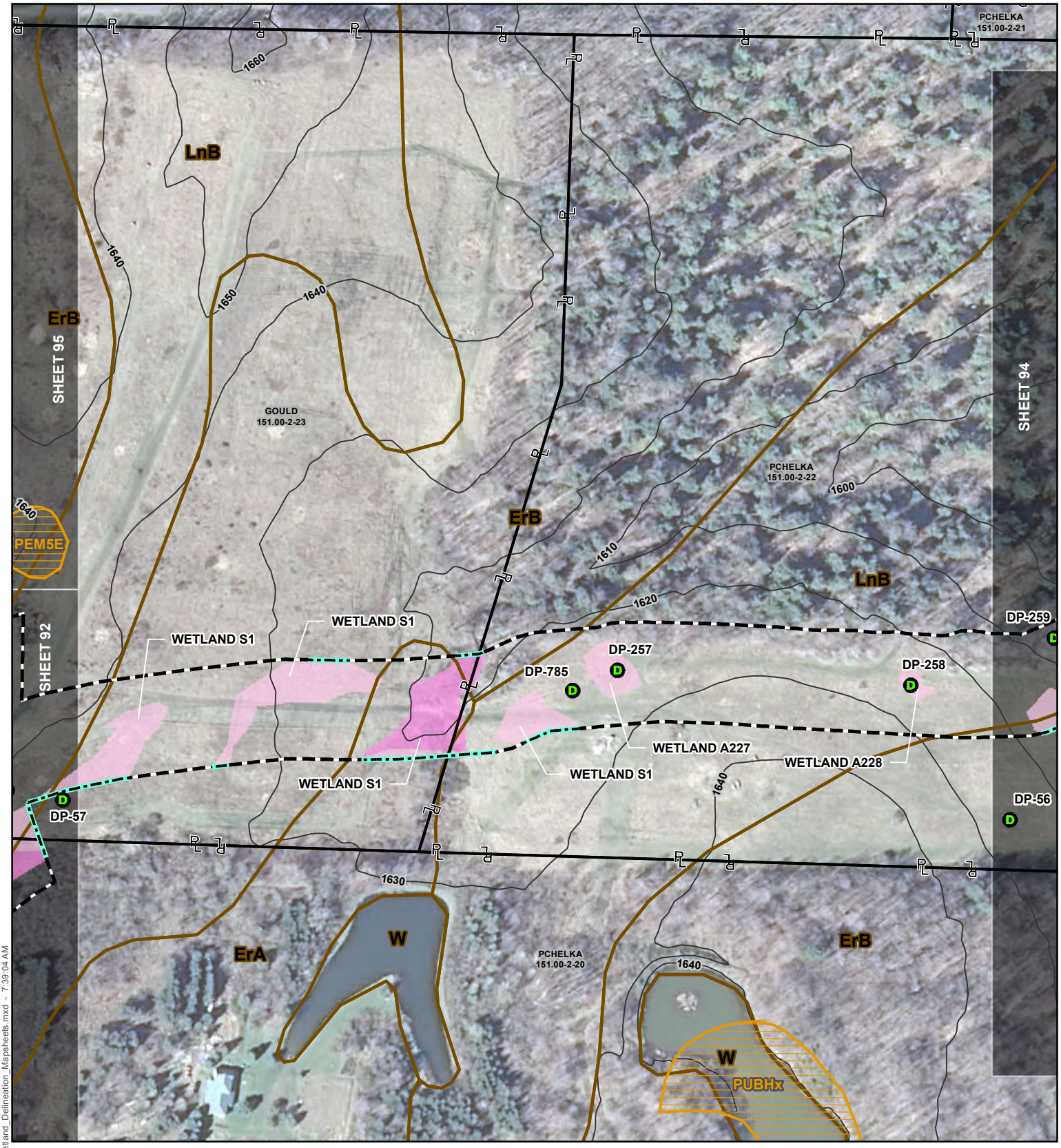

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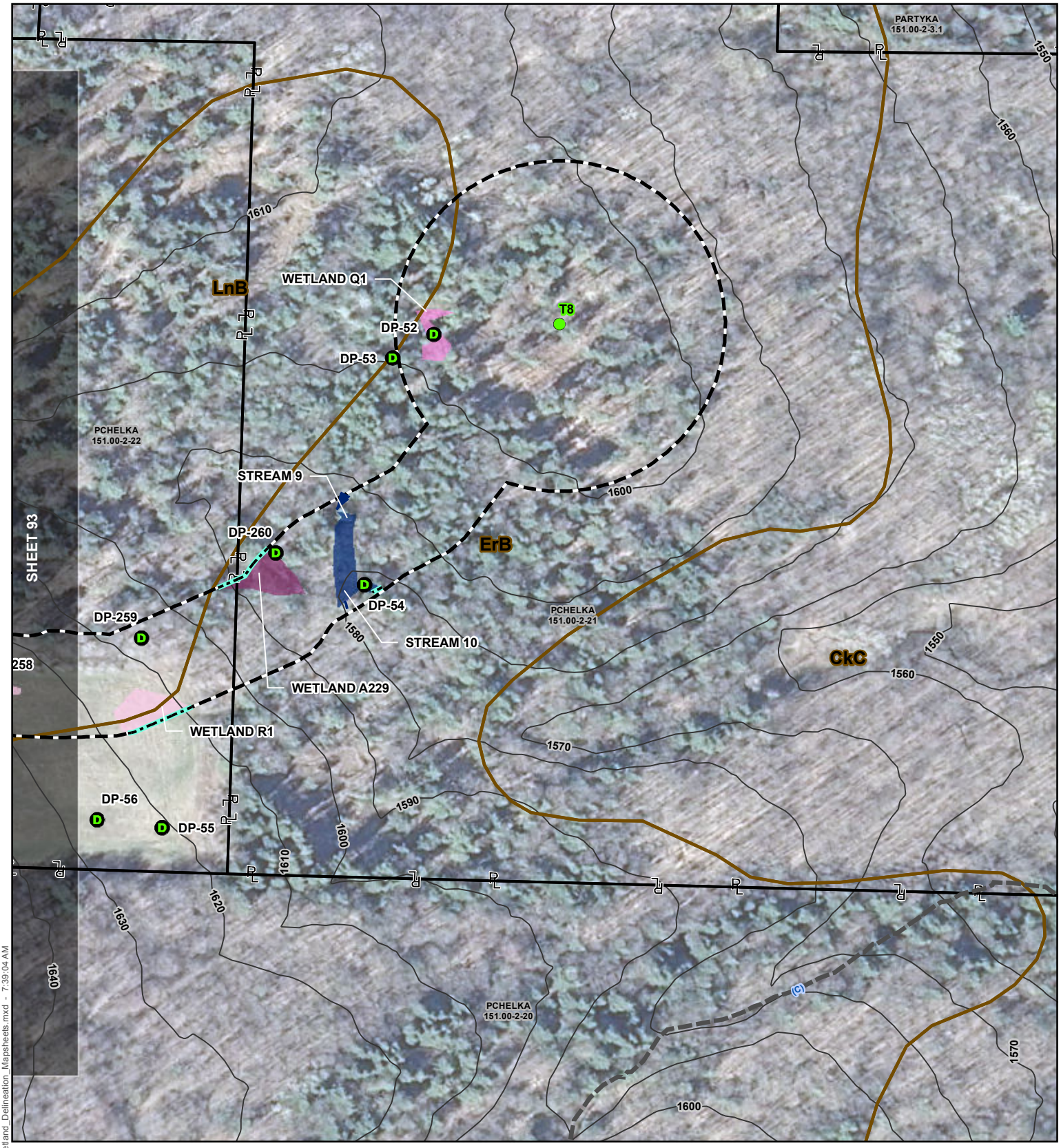

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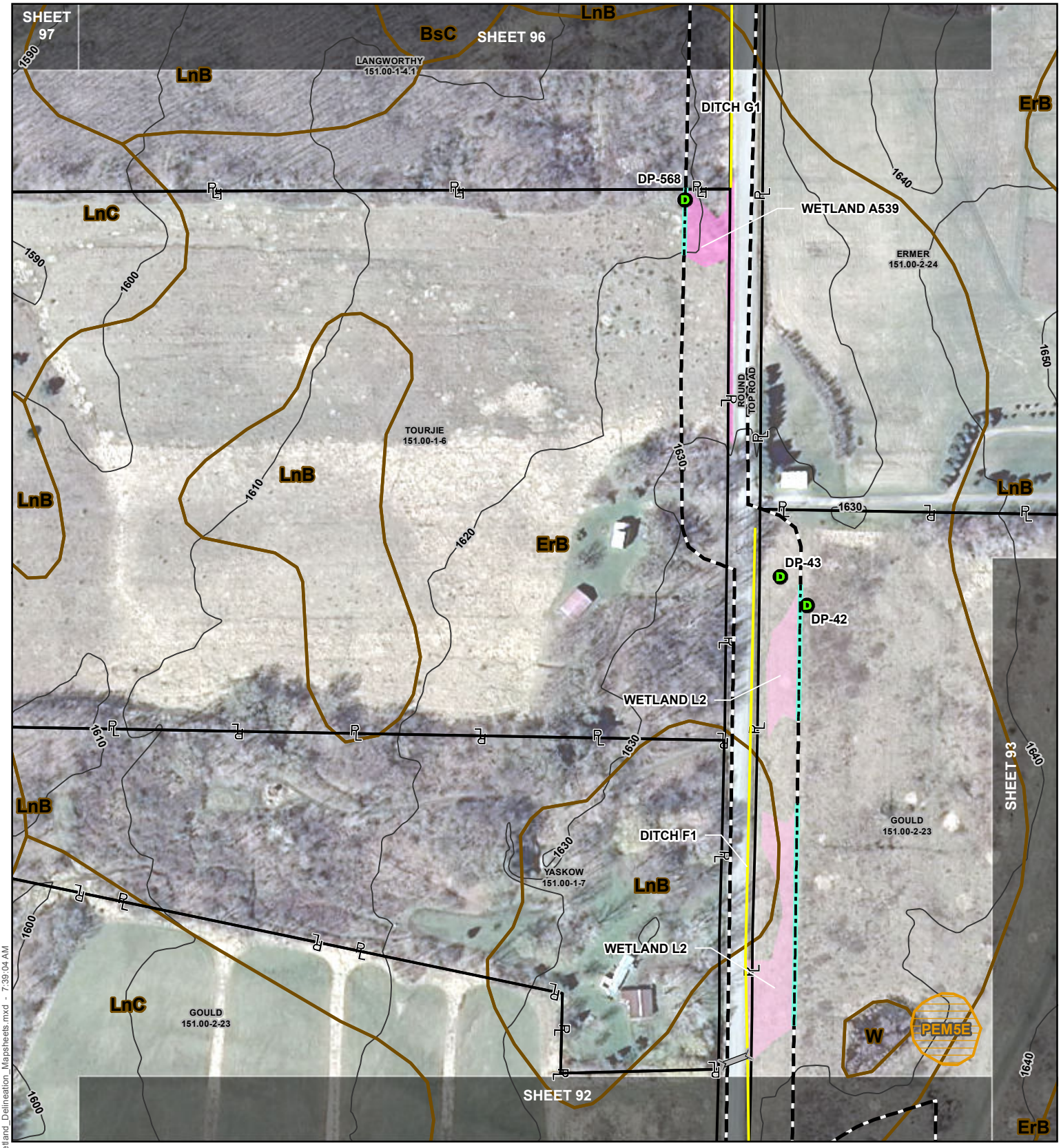

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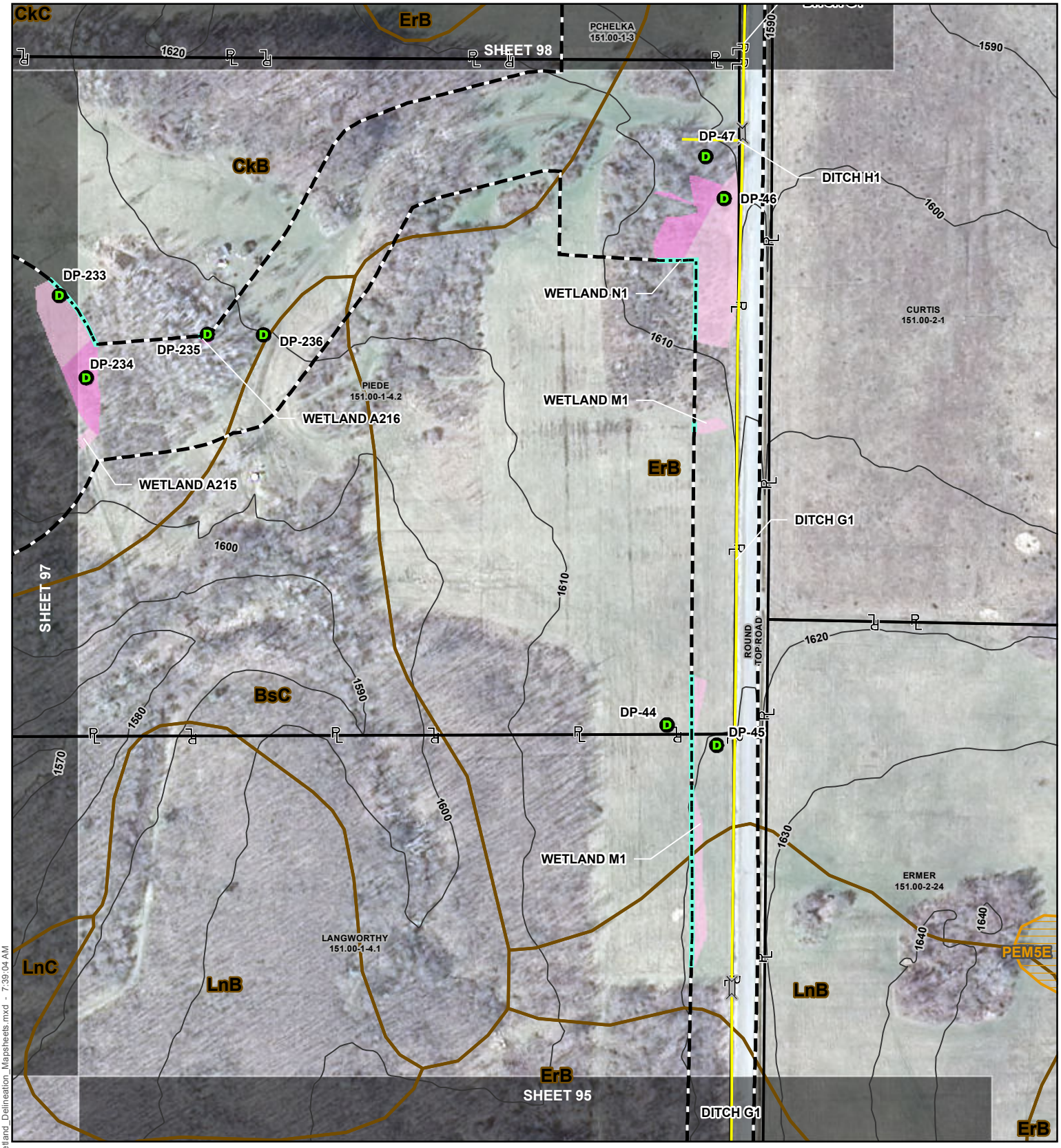

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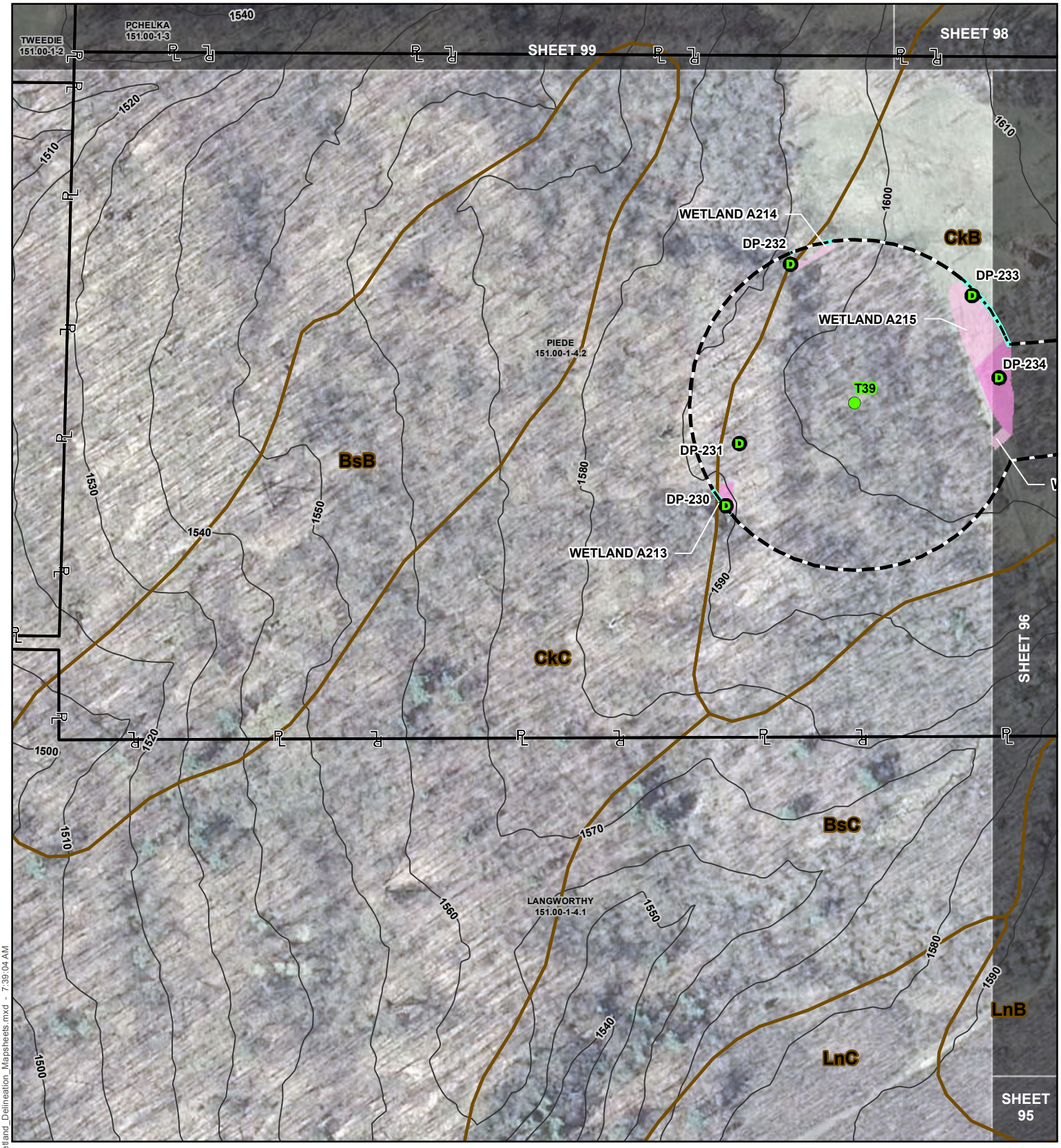

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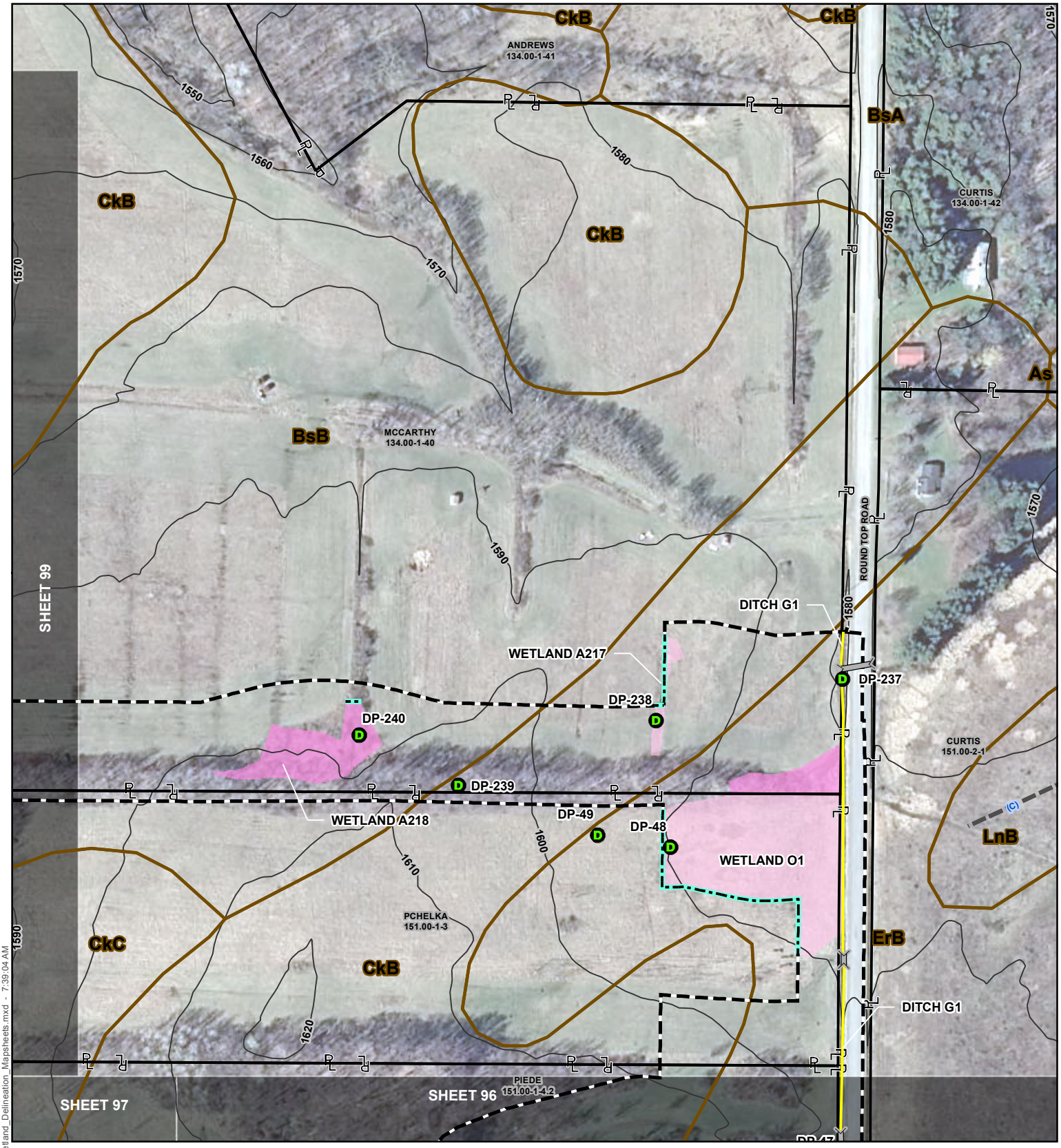

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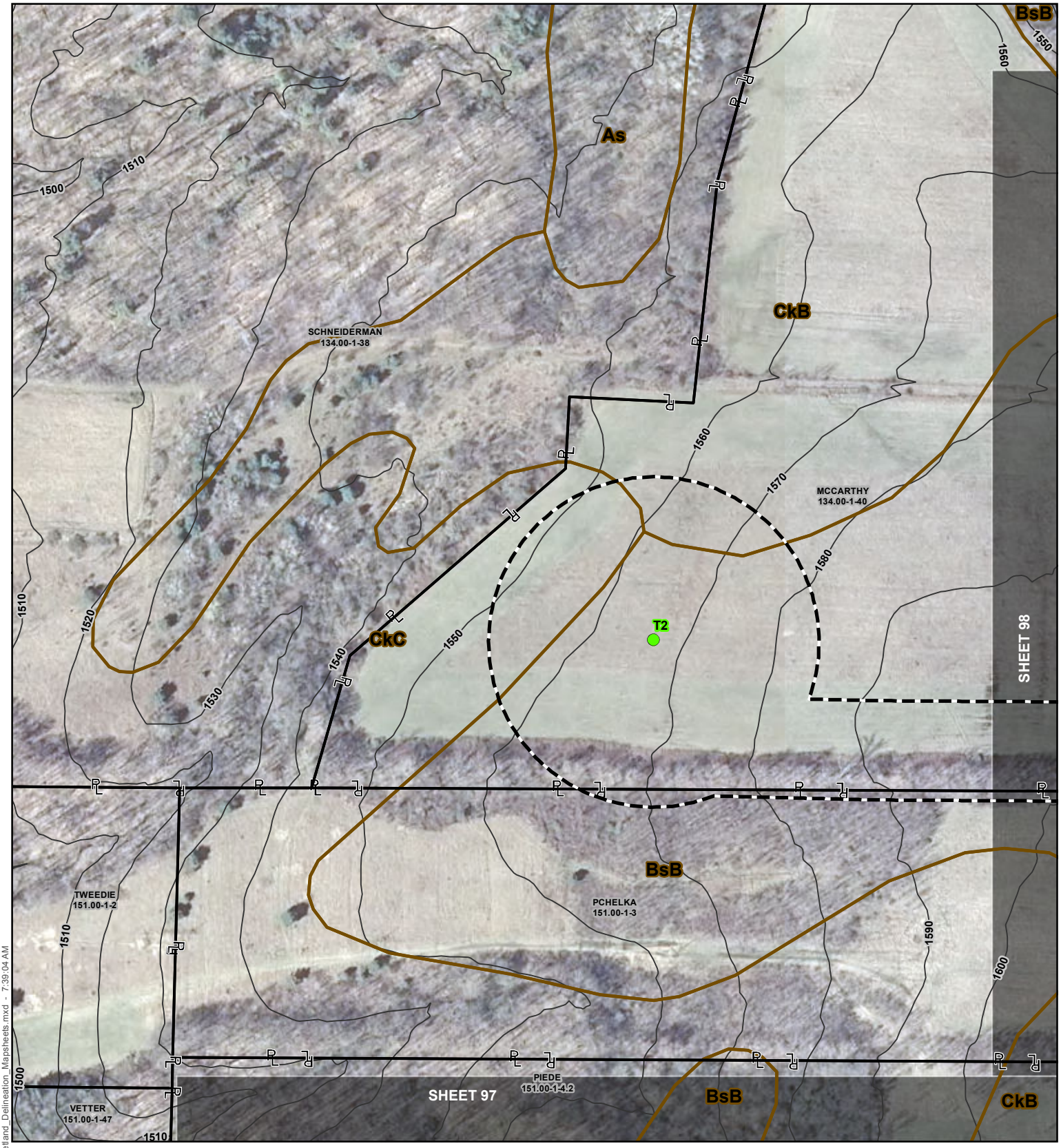

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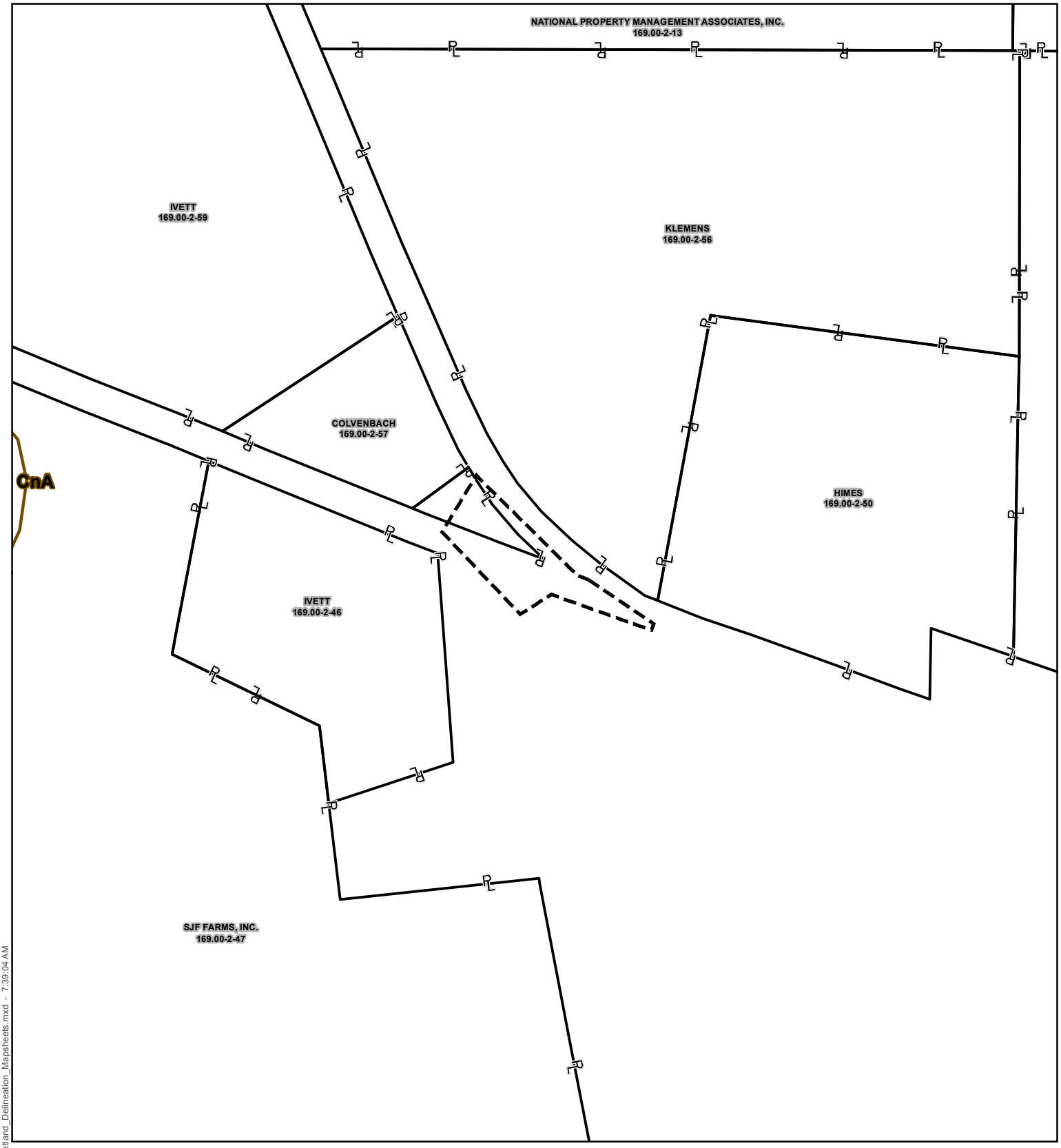

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TABLES

Table 1
Wetland Delineation Summary

Wetland ID	Map Sheet #	Associated Data Sheet #	Cowardin Classification	Coordinates		Wetland Area within Study Limits		Soils	
				Latitude	Longitude	Square Feet	Acres	Soil Symbol	Hydric Component Percentage
A10	22	DP-103, DP-104	PEM	42.440918	-79.128854	9,683	0.22	CkB	0
A200	55 & 56	DP-202, DP-203	PFO	42.411127	-79.128120	11,370	0.26	ErB	5
						189	0.00	LnC	0
						1,786	0.04	As	90
		DP-201, DP-203	PSS			2,791	0.06	ErB	5
		DP-200, DP-203	PEM			3,060	0.07	ErB	5
						3,197	0.07	As	90
A201	52 & 53	DP-204, DP-205	PEM	42.413515	-79.133826	6,022	0.14	ErA	4
						18,766	0.43	ErB	5
						675	0.02	LnC	0
A202	52	DP-206, DP-207	PEM	42.414739	-79.134125	2,319	0.05	ErA	4
A203	52	DP-208, DP-207	PEM	42.416748	-79.134416	951	0.02	ErB	5
						4,575	0.11	LnC	0
						125	0.003	W	0
		DP-209, DP-207	PSS			6,233	0.14	LnC	0
						1,113	0.03	W	0
A204	51	DP-213, DP-215	PEM	42.417606	-79.137918	5,446	0.13	ErB	5
A205	50 & 51	DP-214	PFO	42.418133	-79.13815	19,970	0.46	ErB	5
			PEM	42.418500	-79.137458	9,300	0.21	ErB	5
A206	50 & 54	DP-216	PEM	42.417826	-79.132398	1,820	0.04	ErB	5
A209	50	DP-224, DP-226	PEM	42.420106	-79.135928	1,687	0.04	ErB	5
A210	50	DP-227, DP-226	PEM	42.421705	-79.134646	162	0.004	CkB	0
						1,692	0.04	VaB	0
A211	48	DP-228, DP-226	PEM	42.421931	-79.134200	3,046	0.07	CkB	0
A212	76	DP-229, DP-241	PEM	42.398351	-79.137576	1,190	0.03	LnB	0
A213	97	DP-230, DP-231	PSS	42.407115	-79.169238	853	0.02	CkB	0
						61	0.001	CkC	0
A214	97	DP-232, DP-231	PSS	42.408109	-79.168766	775	0.02	CkB	0
						247	0.01	CkC	0
A215	96 & 97	DP-233, DP-236	PEM	42.407847	-79.167875	6,619	0.15	CkB	0
		DP-234, DP-236	PSS			5,049	0.12	CkB	0
A216	96	DP-235, DP-236	PSS	42.407778	-79.167046	158	0.004	CkB	0
A217	98	DP-238, DP-239	PEM	42.410491	-79.165060	2,193	0.05	CkB	0
A218	98	DP-240, DP-239	PSS	42.410241	-79.167020	14,317	0.33	BsB	4
A219	74	DP-241, DP-242	PEM	42.398541	-79.134812	618	0.01	LnB	0
A220	89	DP-244, DP-245	PEM	42.396616	-79.151465	1,168	0.03	BsB	4
						167	0.004	CkC	0

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				Latitude	Longitude	Square Feet	Acres	Soil Symbol	Hydric Component Percentage
A221	83	DP-247, DP-250	PEM	42.392611	-79.143068	2,716	0.06	CkC	0
A222	83	DP-248, DP-250	PEM	42.393269	-79.141601	2,608	0.06	Fe	60
A223	83	DP-252	PEM	42.392245	-79.143121	478	0.01	CkC	0
A224	85	DP-253, DP-256	PEM	42.389500	-79.145130	480	0.01	CkB	0
A225	85	DP-254, DP-256	PEM	42.389531	-79.144839	522	0.01	CkB	0
						278	0.01	CkC	0
A226	84	DP-255, DP-256	PEM	42.389819	-79.144863	661	0.02	CkC	0
A227	93	DP-257, DP-259	PEM	42.400254	-79.159601	4,825	0.11	LnB	0
A228	93	DP-258, DP-259	PEM	42.400207	-79.157907	1,519	0.03	LnB	0
A229	94	DP-260, DP-259	PFO	42.400653	-79.156410	4,292	0.10	ErB	5
A230	40	DP-265, DP-267	PEM	42.430979	-79.115781	22	0.001	CkB	0
A231	40	DP-266, DP-267	PEM	42.430838	-79.116550	14	0.0003	BsB	4
A232	34	DP-269, DP-271	PEM	42.451832	-79.108376	436	0.01	CnB	0
						96	0.002	CnC	0
A233	34	DP-270, DP-271	PEM	42.451772	-79.109334	261	0.01	CnC	0
A234	32	DP-273	PEM	42.451933	-79.112032	2,289	0.05	Fe	60
						175	0.004	VcC	0
A235	32	DP-274, DP-279	PEM	42.452240	-79.112389	616	0.01	CkC	0
A236	31 & 32	DP-276, DP-279	PEM	42.452630	-79.115858	1,392	0.03	FmA	5
		DP-277, DP-279	PSS			14,039	0.32	FmA	5
A237	12	DP-289, DP-290	PEM	42.467603	-79.149024	1,478	0.03	ToF	0
A238	12	DP-290, DP-291	PEM	42.468779	-79.149069	7,265	0.17	FmB	5
						578	0.01	OrC	5
		DP-292, DP-291	PSS			10,450	0.24	OrC	5
A239	11	DP-295, DP-297	PEM	42.473531	-79.149425	9,007	0.21	FmA	5
						3,620	0.08	FmB	5
		DP-296, DP-297	PFO			741	0.02	FmA	5
						6,111	0.14	FmB	5
A3	24	NA	PEM	42.439187	-79.121471	3,162	0.07	Ad	95
						51	0.001	BsB	4
A5	24	DP-91, DP-92	PEM	42.439117	-79.121790	8,228	0.19	Ad	95
						2,384	0.05	BsB	4
A500	73	DP-500, DP-501	PEM	42.403087	-79.134373	5,706	0.13	Fe	60
A501	72 & 73	DP-503	PEM	42.403850	-79.134128	15,641	0.36	ChD	0
						308	0.01	Fe	60
A502	72	DP-505, DP-506	PEM	42.405005	-79.133730	18,249	0.42	ChD	0
A503	72	DP-507, DP-508	PEM	42.405841	-79.131680	3,717	0.09	ErB	5

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A504	58 & 59	DP-509, DP-510	PEM	42.406129	-79.121084	710	0.02	CkB	0
						4,512	0.10	CkC	0
A505	59	DP-511	PEM	42.405372	-79.119716	933	0.02	CkB	0
A506	59	DP-512	PEM	42.405643	-79.119775	301	0.01	BsB	4
						468	0.01	CkB	0
A508	60	DP-514, DP-515	PEM	42.407723	-79.111375	1,777	0.04	FmA	5
						1,803	0.04	FmB	5
A511	66	DP-521	PEM	42.397186	-79.110999	2,488	0.06	DaA	4
A512	82	DP-523, DP-524	PEM	42.395707	-79.140792	8,778	0.20	CkB	0
A514	83	NA	PEM	42.393088	-79.141586	540	0.01	Fe	60
A515	83	DP-528, DP-529	PEM	42.392690	-79.142534	1,660	0.04	CkC	0
A517	66	DP-533, DP-534	PFO	42.395587	-79.108558	4,717	0.11	DaA	4
A518	67	DP-535, DP-536	PEM	42.396569	-79.104573	327	0.01	FmA	5
						5,320	0.12	FmC	5
A519	67	DP-537, DP-538	PEM	42.395673	-79.101456	8,858	0.20	FmB	5
A520	67	NA	PEM	42.396366	-79.102028	1,709	0.04	FmB	5
A524	85	DP-545, DP-546	PEM	42.387291	-79.144729	10,103	0.23	BsB	4
A526	84	DP-549, DP-551	PFO	42.390096	-79.145581	525	0.01	CkB	0
						610	0.01	CkC	0
A527	84	DP-550, DP-551	PFO	42.390725	-79.145203	34	0.001	CkC	0
A531	84 & 89	DP-557, DP-558	PEM	42.393957	-79.148914	2,768	0.06	As	90
A532	91	DP-555, DP-556	PEM	42.394884	-79.157658	4,191	0.10	LnB	0
A533	91	NA	PEM	42.394871	-79.159947	3,177	0.07	ErA	4
						276	0.01	ErB	5
						4	0.00	LnB	0
A534	89	DP-559, DP-560	PEM	42.395193	-79.149367	26,430	0.61	As	90
						5,195	0.12	BsB	4
A535	89	DP-561, DP-562	PFO	42.397207	-79.150054	2,229	0.05	BsB	4
A539	95	DP-568	PSS	42.403940	-79.164162	9,522	0.22	ErB	5
A540	30	DP-569, DP-570	PEM	42.445770	-79.119774	929	0.02	VcC	0
A541	27 & 30	DP-571	PEM	42.445546	-79.120997	358	0.01	VcC	0
A542	30	DP-572	PEM	42.445973	-79.121003	3,442	0.08	VcC	0
A543	31	DP-575, DP-576	PEM	42.453115	-79.118254	9,595	0.22	FmA	5
						149	0.003	OrB	5
A544	31	DP-577, DP-578	PEM	42.452342	-79.119055	2,371	0.05	FmB	5
						17,100	0.39	OrB	5
A545	31	NA	PEM	42.451800	-79.119529	11,578	0.27	FmB	5

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				Latitude	Longitude	Square Feet	Acres	Soil Symbol	Hydric Component Percentage
A546	30 & 31	DP-579, DP-580	PEM	42.450085	-79.119719	8,804	0.20	BsB	4
						1,551	0.04	VcC	0
A547	30	DP-581, DP-582	PFO	42.448612	-79.119598	2,054	0.05	VcC	0
A548	29	DP-583, DP-584	PFO	42.447405	-79.123198	4,639	0.11	As	90
						3,320	0.08	BsB	4
A549	27 & 30	DP-585, DP-586	PEM	42.445723	-79.121620	3,044	0.07	VcC	0
			PFO			847	0.02	VcC	0
A550	27	NA	PEM	42.444925	-79.121706	381	0.01	VcC	0
A551	27	NA	PEM	42.444951	-79.121314	27	0.00	VcC	0
A552	27	DP-595, DP-596	PSS	42.442824	-79.121339	17,120	0.39	BsB	4
						4,947	0.11	CkB	0
A557	24	DP-601, DP-602	PEM	42.440762	-79.120012	7,259	0.17	BsB	4
						3,870	0.09	CkB	0
A558	27	NA	PEM	42.442325	-79.121654	6,900	0.16	BsB	4
A559	27	DP-597, DP-598	PEM	42.441582	-79.121480	2,335	0.05	VaB	0
A560	24	DP-599, DP-600	PEM	42.440877	-79.121367	4,727	0.11	BsB	4
A561	24	DP-603	PEM	42.440808	-79.118293	2,201	0.05	CkB	0
A562	25	DP-604, DP-605	PEM	42.441032	-79.116830	5,470	0.13	BsA	6
						6,333	0.15	CkB	0
A563	25	NA	PFO	42.440920	-79.115289	1,679	0.04	BsA	6
						3,107	0.07	CkB	0
A564	25	DP-606, DP-607	PEM	42.439995	-79.114437	12,407	0.28	BsA	6
A565	25	DP-610, DP-611	PEM	42.437583	-79.114014	8,343	0.19	BsB	4
A566	39	NA	PEM	42.435711	-79.113677	5,652	0.13	CkC	0
						729	0.02	CoB	0
A567	39	DP-613, DP-614	PSS	42.435330	-79.112336	5,666	0.13	CoB	0
A569	40	NA	PEM	42.431196	-79.114392	1,468	0.03	CkB	0
A570	40	DP-617, DP-618	PEM	42.432942	-79.112888	5,673	0.13	CkC	0
A571	22	NA	PEM	42.441586	-79.128631	468	0.01	BsB	4
						465	0.01	CkB	0
A572	22	NA	PEM	42.441502	-79.127787	723	0.02	BsB	4
A576	22	NA	PEM	42.442020	-79.128865	917	0.02	As	90
						5,230	0.12	CkC	0
A577	21 & 22 & 28	NA	PEM	42.442850	-79.128237	6,109	0.14	As	90
						1	0.00002	BsB	4
						221	0.01	CkC	0

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				Latitude	Longitude	Square Feet	Acres	Soil Symbol	Hydric Component Percentage
A578	21 & 22	DP-622, DP-623	PFO	42.442364	-79.129099	6,075	0.14	As	90
						484	0.01	BsB	4
						3,146	0.07	CkC	0
			PSS			8,797	0.20	As	90
						5,417	0.12	BsB	4
						2,145	0.05	CkC	0
A580	21	DP-626, DP-627	PEM	42.445153	-79.128690	10,563	0.24	BsB	4
A581	21	DP-625, DP-627, DP-628,DP-629	PEM	42.445420	-79.129021	3,597	0.08	CkB	0
			PSS			16,587	0.38	BsB	4
						5,064	0.12	CkB	0
A582	19 & 20 & 21	DP-630, DP-631	PFO	42.447440	-79.131856	32,071	0.74	BsB	4
						10,690	0.25	CkB	0
						227	0.01	FmB	5
A583	19	DP-632, DP-633, DP-634, DP-635	PEM	42.449519	-79.134858	9,960	0.23	FmB	5
			PFO			8,091	0.19	FmB	5
			PSS			16,371	0.38	FmA	5
						12,708	0.29	FmB	5
A584	19	N/A	PSS	42.449725	-79.134371	1,005	0.02	FmB	5
A585	18	DP-636, DP-637	PFO	42.451892	-79.134838	2,123	0.05	Ad	95
						5,924	0.14	BsB	4
						17,103	0.39	OrA	5
A586	18	DP-638, DP-639	PFO	42.453277	-79.134717	4,740	0.11	Ad	95
						29,543	0.68	BsB	4
						1,089	0.02	CkB	0
A587	17 & 18	DP-640, DP-641	PFO	42.454214	-79.137108	41,567	0.95	Ad	95
						33,110	0.76	As	90
						17,791	0.41	BsB	4
						11,730	0.27	CkB	0
						8,533	0.20	ShB	0
			PSS			26,776	0.61	BsB	4
						1,796	0.04	FmA	5
						81,656	1.87	FmB	5
A591	14	DP-648, DP-649	PSS	42.462145	-79.149115	43,830	1.01	FmA	5
						948	0.02	FmB	5
						8,283	0.19	OrB	5
A592	15	DP-650, DP-651	PEM	42.457476	-79.147747	17,189	0.39	FmA	5
			PFO			47,393	1.09	FmA	5
A593	3	DP-652, DP-653	PFO	42.507042	-79.154842	1,524	0.03	Cb	96
						101,566	2.33	NgA	4

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A594	3 & 4	DP-653, DP-654	PFO	42.505457	-79.152718	42,242	0.97	Cb	96
						21,945	0.50	NgA	4
A595	45	DP-659, DP-660	PEM	42.429065	-79.126053	6,505	0.15	BsB	4
						3,294	0.08	VaD	0
A596	69	DP-661, DP-662	PFO	42.399097	-79.103512	141	0.003	FmA	5
A597	60	DP-663, DP-664	PSS	42.407857	-79.114228	2,131	0.05	ErB	5
						8,827	0.20	FmA	5
A598	60 & 61	DP-668, DP-669	PEM	42.409029	-79.110778	607	0.01	FmB	5
			PFO			13,732	0.32	FmB	5
A599	60	DP-670, DP-671	PFO	42.409507	-79.110809	1,955	0.04	FmB	5
A6	23 & 24	DP-93, DP-94	PEM	42.440659	-79.122537	9,729	0.22	BsB	4
A600	59	DP-672, DP-673	PEM	42.406497	-79.119078	15,716	0.36	BsB	4
A601	59	DP-674	PSS	42.406093	-79.119635	2,384	0.05	BsB	4
A602	47	DP-675, DP-676	PEM	42.427944	-79.135196	2,114	0.05	BsA	6
A603	46	DP-677, DP-678	PEM	42.426385	-79.133849	956	0.02	BsA	6
A604	48	NA	PEM	42.424700	-79.133701	3,891	0.09	BsB	4
A605	44	DP-680, DP-681, DP-682	PEM	42.431173	-79.133990	152	0.003	As	90
						1,426	0.03	BsB	4
			PSS			10,218	0.23	As	90
						379	0.01	BsB	4
A606	44	DP-683, DP-684	PEM	42.432201	-79.134074	262	0.01	BsA	6
						1,143	0.03	CkB	0
			PSS			23	0.001	BsA	6
						60	0.001	BsB	4
						29,051	0.67	CkB	0
A607	44	NA	PEM	42.432665	-79.134324	251	0.01	BsA	6
A608	44	DP-687, DP-688	PEM	42.433968	-79.130846	1,323	0.03	CkB	0
						281	0.01	VaB	0
A609	43	DP-689, DP-690	PFO	42.434421	-79.130624	1,078	0.02	CkB	0
A610	43	DP-691, DP-692	PEM	42.434963	-79.131394	1,880	0.04	CkB	0
						203	0.00	VcC	0
A611	42	DP-693 & DP-694	PEM	42.439939	-79.134273	1,603	0.04	CkB	0
			PFO			5,194	0.12	CkB	0
A612	42	NA	PEM	42.439451	-79.134948	488	0.01	CkB	0
A613	42	DP-695, DP-696	PEM	42.438896	-79.134627	1,509	0.03	VcC	0
A614	43	DP-697, DP-698	PFO	42.437284	-79.134328	504	0.01	BsB	4
						2,721	0.06	VcC	0

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A615	43	DP-699, DP-700, DP-703	PEM	42.436307	-79.132704	980	0.02	BsB	4
						530	0.01	CkB	0
						6,785	0.16	VcC	0
			PFO			3,209	0.07	BsB	4
						2,234	0.05	CkB	0
						5,590	0.13	VcC	0
			PSS			27,262	0.63	BsB	4
						287	0.01	VcC	0
A616	43	DP-701, DP-702	PEM	42.435984	-79.132442	359	0.01	CkB	0
						6,807	0.16	VcC	0
A617	22 & 42	DP-716, DP-717	PEM	42.439336	-79.132824	1,769	0.04	CkB	0
			PFO			5,453	0.13	BsB	4
						1,192	0.03	CkB	0
			PSS			4,062	0.09	BsB	4
						6,394	0.15	CkB	0
A618	37	DP-704, DP-705, DP-706	PEM	42.447070	-79.102435	7,292	0.17	CkC	0
						0.16	0.000004	VaB	0
			PFO			10,201	0.23	CkC	0
A619	36	DP-708, DP-709	PEM	42.452123	-79.103289	2,881	0.07	CnB	0
						1,080	0.02	CnC	0
A620	35 & 36	DP-710, DP-711, DP-714, DP-715	PEM	42.457594	-79.104984	14,862	0.34	CsB	5
						151	0.003	CsC	5
						37,604	0.86	FmB	5
						404	0.01	NgB	4
						547	0.01	UnC	0
A622	22	DP-718	PEM	42.439851	-79.132097	487	0.01	BsB	4
			PFO			2,731	0.06	BsB	4
A623	22	NA	PEM	42.439753	-79.130789	2,086	0.05	BsB	4
			PFO			5,741	0.13	BsB	4
A624	22	DP-721, DP-722, DP-723	PEM	42.439737	-79.129808	6,940	0.16	BsB	4
			PSS			11,733	0.27	BsB	4
A625	25	DP-724, DP-725	PEM	42.440946	-79.113749	1,073	0.02	BsA	6
						1,418	0.03	CkB	0
A626	25 & 26	DP-726, DP-727	PEM	42.440590	-79.111829	4,479	0.10	CkB	0

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A627	26	DP-728, DP-729	PFO	42.440590	-79.111829	5,162	0.12	VcC	0
			PEM			6,038	0.14	VcC	0
A628	21	DP-730, DP-731	PEM	42.444086	-79.128142	3,277	0.08	BsB	4
A629	19 & 20	DP-732 , DP-733	PFO	42.449238	-79.132400	11,843	0.27	FmB	5
A630	19 & 20	DP-733, DP-734	PEM	42.449654	-79.132414	2,908	0.07	FmB	5
A631	21	NA	PSS	42.444777	-79.129129	3,583	0.08	BsB	4
A633	16	DP-738, DP-739	PSS	42.454462	-79.142324	17,838	0.41	FmA	5
A634	16	DP-740, DP-741	PEM	42.455294	-79.145110	4,900	0.11	FmB	5
			PFO			1,888	0.04	FmB	5
A635	16	DP-742, DP-743	PSS	42.455831	-79.145639	72	0.00	As	90
						20,397	0.47	FmA	5
						16,000	0.37	FmB	5
A635A	100	DP-755, DP-756	PEM	42.419251	-79.152058	987	0.02	BsB	4
A635B	24	DP-748, DP-749	PEM	42.438193	-79.120932	5,822	0.13	As	90
						1,656	0.04	CkC	0
A636	27 & 28	DP-751, DP-752	PEM	42.444704	-79.122092	2,704	0.06	VcC	0
A638	11	DP-758, DP-759	PFO	42.474730	-79.149398	36,250	0.83	FmA	5
						5,409	0.12	FmB	5
A639	9 & 10	DP-763, DP-764	PFO	42.479641	-79.149309	4,931	0.11	ToF	0
A640	8	DP-768, DP-769	PEM	42.484643	-79.149706	223	0.01	HrB	5
A641	7 & 8	DP-773, DP-774, DP-775	PEM	42.490148	-79.150912	29,923	0.69	BrB	3
						51,470	1.18	NgA	4
						4,904	0.11	Po	0
						63	0.001	Rh	5
			PFO			9,830	0.23	BrB	3
						10,549	0.24	HrD	5
			PSS			16,016	0.37	NgA	4
A642	7	NA	PSS	42.490707	-79.152676	3,013	0.07	Po	0
						8,017	0.18	Rh	5
A643	4 & 5 & 6	DP-777, DP-778	PEM	42.497489	-79.153496	7,114	0.16	Cb	96
						59,258	1.36	NgA	4
						3,294	0.08	Sw	8
						80	0.002	W	0
			PFO			6,890	0.16	Cb	96
						67,974	1.56	NgA	4
			PSS			83,299	1.91	Cb	96
						153,937	3.53	NgA	4
						3,103	0.07	Sw	8
						981	0.02	W	0

Original Submittal: July 2016
Revised: October 2016

Table 1
Wetland Delineation Summary

Wetland ID	Map Sheet #	Associated Data Sheet #	Cowardin Classification	Coordinates		Wetland Area within Study Limits		Soils	
				Latitude	Longitude	Square Feet	Acres	Soil Symbol	Hydric Component Percentage
A644	4	DP-779, DP-780	PEM	42.503483	-79.152810	17,609	0.40	NgA	4
						49,955	1.15	NgA	4
A645	29	DP-783, DP-784	PEM	42.448430	-79.124129	2,493	0.06	FmB	5
A8	22	DP-100	PEM	42.440717	-79.129155	309	0.01	BsB	4
						9,592	0.22	CkB	0
A9	22	DP-101,DP-102	PEM	42.441266	-79.127960	1	0.00002	BsB	4
C1	56	DP-13, DP-14	PEM	42.410643	-79.127863	47,411	1.09	As	90
						17,155	0.39	ErB	5
						89	0.00	LnB	0
D1	55 & 56	DP-15, DP-16	PEM	42.412100	-79.128839	9,518	0.22	ErB	5
F1	49	DP-19, DP-20	PEM	42.422137	-79.141785	6,464	0.15	As	90
						19,528	0.45	CkB	0
G1	49	DP-21	PEM	42.421842	-79.138120	3,804	0.09	As	90
						9,590	0.22	CkB	0
H1	48 & 49	DP-22, DP-23, DP-226	PEM	42.422016	-79.137329	436	0.01	As	90
I1	48	DP-24, DP-23	PEM	42.422036	-79.135157	2,546	0.06	VaB	0
I2	48	DP-24, DP-23	PEM	42.422420	-79.135127	815	0.02	VaB	0
J1	78	DP-26, DP-27	PEM	42.405382	-79.144330	35,194	0.81	BsB	4
						20,469	0.47	LnC	0
J2	80 & 81	DP-28, DP-29	PEM	42.406558	-79.146200	26,038	0.60	BsB	4
						26,589	0.61	CkC	0
J3	81	DP-30, DP-31, DP-263	PEM	42.408448	-79.149541	13,368	0.31	CkB	0
						24,460	0.56	CkC	0
J4	79	DP-32, DP-33	PEM	42.407140	-79.140616	3,174	0.07	CkC	0
						5,055	0.12	ErB	5
						11,848	0.27	LnB	0
K3	92	DP-38, DP-39	PEM	42.399097	-79.163962	9,411	0.22	LnB	0
L1	92	DP-40, DP-41	PEM	42.399949	-79.163840	3,277	0.08	ErB	5
						823	0.02	LnB	0
L2	95	DP-42, DP-43	PEM	42.401466	-79.163784	23,113	0.53	ErB	5
						1,924	0.04	LnB	0
M1	96	DP-44, DP-45	PEM	42.406045	-79.164288	3,284	0.08	ErB	5
						2,883	0.07	LnB	0
N1	96	DP-46, DP-47	PEM	42.408103	-79.164184	14,837	0.34	ErB	5
			PSS			6,079	0.14	ErB	5
O1	98	DP-48, DP-49	PEM	42.409821	-79.164499	46,216	1.06	ErB	5
			PSS			7,599	0.17	ErB	5

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Table 1
Wetland Delineation Summary

Wetland ID	Map Sheet #	Associated Data Sheet #	Cowardin Classification	Coordinates		Wetland Area within Study Limits		Soils	
				Latitude	Longitude	Square Feet	Acres	Soil Symbol	Hydric Component Percentage
Q1	94	DP-52, DP-53	PSS	42.401654	-79.155496	2,312	0.05	ErB	5
						54	0.001	LnB	0
R1	94	DP-55, DP-56	PEM	42.400072	-79.157045	2,151	0.05	ErB	5
						2,579	0.06	LnB	0
S1	92 & 93	DP-57, DP-58	PEM	42.400061	-79.161755	1,854	0.04	ErA	4
						22,374	0.51	ErB	5
						9,518	0.22	LnB	0
			PSS			10,481	0.24	ErA	4
						3,638	0.08	ErB	5
						1,944	0.04	LnB	0
U1	92	DP-61, DP-62	PEM	42.396823	-79.162740	1,270	0.03	ErA	4
V1	45	DP-64, DP-65	PEM	42.428442	-79.125650	26,939	0.62	BsB	4
V3	45	DP-74, DP-75	PEM	42.428901	-79.128368	3,080	0.07	CkC	0
						1,444	0.03	VaD	0
			PSS			21	0.0005	CkC	0
						462	0.01	VaD	0
V4	46 & 47	DP-79, DP-80	PEM	42.428268	-79.134938	7,670	0.18	BsA	6
						7,787	0.18	BsB	4
W1	44	DP-77, DP-78	PFO	42.433652	-79.133958	6,368	0.15	As	90
X1	44	DP-81, DP-82	PEM	42.432777	-79.133093	2,808	0.06	BsA	6
						8,352	0.19	CkB	0
Y2	44	DP-86, DP-87	PFO	42.433159	-79.130826	1,524	0.03	VaB	0

Table 2
Stream Delineation Summary

Stream ID	Map Sheet #	Associated Data Sheet #	Stream Name	Tributary of	Flow Regime	NYSDEC Classification Designation*	NYSDEC Standard Designation	Latitude	Longitude	Stream Width (Top of Bank Average, Ft.)	Stream Reach Length (Within Study Limits, Linear Ft.)
9	94	NA	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.400963	-79.156009	NA	27
10	94	DP-54	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.400719	-79.155975	25	198
11	45	DP-63	Unnamed Tributary	Silver Creek	Perennial	C	ND	42.428269	-79.125540	4	104
13	44	DP-69	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.433280	-79.131510	10	180
14	45	DP-72	Unnamed Tributary	Silver Creek	Perennial	C	ND	42.428879	-79.126781	1	293
15	45	DP-73	Unnamed Tributary	Silver Creek	Perennial	C	ND	42.428755	-79.128560	3.5	202
18	24	DP-90	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.439180	-79.121816	5.5	163
19	23	DP-95	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.440794	-79.123432	5	107
A200	50	DP-210	Unnamed Tributary	West Branch Conewango Creek	Ephemeral	C	ND	42.417709	-79.136189	7.5	57
A200	50, 51, 52	DP-211	Unnamed Tributary	West Branch Conewango Creek	Intermittent	C	ND	42.417713	-79.136708	7.5	460
A202	50	DP-222	Unnamed Tributary	West Branch Conewango Creek	Intermittent	C	ND	42.419999	-79.135831	2.5	101
A203	89	DP-243	Unnamed Tributary	West Branch Conewango Creek	Intermittent	D	ND	42.396661	-79.151540	5	80
A204	83	DP-249	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.388427	-79.145817	9	93
A204A	85	DP-261	Unnamed Tributary	West Branch Conewango Creek	Intermittent	D	ND	42.393313	-79.141510	3.5	59
A205	32	DP-272	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.452019	-79.112011	16	159
A206	32	DP-275	Unnamed Tributary	Silver Creek	Ephemeral	D	ND	42.452370	-79.114058	2.5	42
A207	31, 32	DP-278	Unnamed Tributary	Silver Creek	Intermittent	A	ND	42.452586	-79.115894	3	181
A208	12, 13	DP-286	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.467190	-79.149160	5	154
A209	13	DP-285	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.467322	-79.149027	2.5	31
A210	12	DP-287	Unnamed Tributary	Walnut Creek	Intermittent	C	ND	42.467758	-79.149356	20.5	238
A211	12, 13	DP-288	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.467140	-79.149415	5	377
A212	12	DP-293	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.469638	-79.149417	6	181
A213	12	DP-294	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.469319	-79.149683	3	85
A500	73	DP-502	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.403413	-79.134287	13	121
A501	72, 73	DP-504	Unnamed Tributary	West Branch Conewango Creek	Intermittent	D	ND	42.405746	-79.133563	4	524
A502	62	DP-520	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.402294	-79.119785	10	159
A503	73	DP-522	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.401297	-79.134854	13	24
A504	83	DP-525	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.393194	-79.141418	20	32
A505	83	DP-526	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.392879	-79.141994	4	207
A506	83	DP-527	Unnamed Tributary	West Branch Conewango Creek	Intermittent	D	ND	42.393005	-79.141658	3	14
A508	66	DP-508	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.395480	-79.108522	5.5	187
A509	85	DP-547	Unnamed Tributary	West Branch Conewango Creek	Perennial	C	ND	42.388535	-79.145737	11	119
A511	27	DP-573	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.445188	-79.121435	7	204
A512	27, 28	DP-574	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.444741	-79.122113	6.5	164
A514	27	DP-587	Unnamed Tributary	Silver Creek	Intermittent	D	ND	42.445253	-79.121440	9	59
A515	27	NA	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.442868	-79.121396	7	177
A518	24	DP-603	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.440890	-79.118159	5.5	213
A519	25	DP-608	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.437947	-79.114137	3.5	101
A520	25	DP-609	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.437476	-79.114061	7	139
A521	39	DP-612	Unnamed Tributary	Silver Creek	Perennial	C	ND	42.435189	-79.112201	10	115
A522	39	DP-619	Unnamed Tributary	Silver Creek	Intermittent	D	ND	42.433581	-79.112798	7	198
A523	21	DP-624	Tupper Creek	Walnut Creek	Perennial	C	ND	42.444370	-79.129051	3	677
A526	1	DP-636	Unnamed Tributary	Silver Creek	Perennial	C	ND	42.512009	-79.158757	17.5	215
A527	7	DP-657	Unnamed Tributary	Walnut Creek	Perennial	C	ND	42.490870	-79.152964	23	272
A528	7	DP-658	Unnamed Tributary	Walnut Creek	Perennial	C	ND	42.490534	-79.152266	9	394
A529	60	DP-666	Unnamed Tributary	North Branch Conewango Creek	Perennial	C	ND	42.407681	-79.114543	10	148
A530	60, 61	DP-667	Unnamed Tributary	North Branch Conewango Creek	Perennial	C	ND	42.408973	-79.110108	8	440
A531	44	DP-685	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.433926	-79.130665	12	188
A532	44	DP-686	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.434053	-79.130961	8	107
A533	36	DP-707	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.451960	-79.102959	23	136
A534	35	DP-712	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.456535	-79.104583	9	129
A535	22	DP-719	Unnamed Tributary	Tupper Creek	Perennial	C	ND	42.439724	-79.130724	4	102
A537	24	DP-747	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.438045	-79.121148	4	207

Table 2
Stream Delineation Summary

Stream ID	Map Sheet #	Associated Data Sheet #	Stream Name	Tributary of	Flow Regime	NYSDEC Classification Designation*	NYSDEC Standard Designation	Latitude	Longitude	Stream Width (Top of Bank Average, Ft.)	Stream Reach Length (Within Study Limits, Linear Ft.)
A538	29	DP-750	Unnamed Tributary	Silver Creek	Perennial	A	ND	42.447298	-79.122798	9	203
A539	10	DP-761	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.478860	-79.149354	3	212
A540	10	DP-762	Unnamed Tributary	Walnut Creek	Perennial	C	ND	42.479524	-79.149391	20	287
A541	9	DP-765	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.481243	-79.149358	7	278
A542	9	DP-766	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.482592	-79.149403	5	312
A543	8, 9	DP-767	Unnamed Tributary	Walnut Creek	Intermittent	D	ND	42.483895	-79.149338	6	252
A544	8	DP-770	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.484671	-79.149599	2	56
A545	8	DP-771	Unnamed Tributary	Walnut Creek	Ephemeral	D	ND	42.485904	-79.149486	4	175
A546	8	DP-772	Unnamed Tributary	Walnut Creek	Intermittent	D	ND	42.487419	-79.149456	5	281
A547	2	DP-781	Unnamed Tributary	Silver Creek	Intermittent	C	ND	42.508736	-79.158319	11	247

Notes:

NYSDEC Classification Designations:

AA or A: waters used as a source of drinking water
B: waters with best usage for swimming and other contact recreation, but not for drinking water
C: waters supporting are subject to the stream protection provisions of the New York State Protection of Waters regulations.
D: other waters, the lowest classification standard

NYSDEC Standard Designations:

ND: no assigned designation
T: may support a trout population
TS: may support trout spawning

Waters with classifications of A, B, and C may, but will not always have an associated Standard Designation relative to trout use.

Streams with a classification of AA, A, B, or with a classification of C with a standard of "T" or "TS" are referred to a "Protected Streams" and are subject to the stream protection provisions of the New York State Protection of Waters regulations.

*Streams that do not appear on the NYSDEC mapping are assigned to Class D, with the exception of any "continuous flowing natural stream" which is assigned the same classification as the water to which it is a tributary. Due to errors in the available electronic mapping, Fisher recommends coordination with NYSDEC to verify stream designations of any streams that may be impacted by the Project.

Table 3
Ditch Delineation Summary

Ditch ID	Map Sheet #	Associated Data Sheet #	Jurisdictional or Non-Jurisdictional*	Latitude	Longitude	Ditch Width (Top of Bank Average, Ft.)	Ditch Reach Length (Within Project Study Limits, Linear Ft.)
A200	50	DP-223	Jurisdictional	42.420263	-79.135835	3	222
A201	32	DP-280	Jurisdictional	42.452181	-79.112637	1.5	18
A201A	83	DP-251	Jurisdictional	42.393048	-79.141867	2.25	256
A203	14	DP-282	Jurisdictional	42.460303	-79.148758	3.4	232
A204	14	DP-283	Jurisdictional	42.460448	-79.148784	3.5	232
A205	13	DP-284	Jurisdictional	42.463756	-79.149309	4.5	218
A501	60	DP-665	Jurisdictional	42.407715	-79.113856	9	178
A504	22	DP-720	Jurisdictional	42.439848	-79.129335	2	68
A507	100	DP-754	Jurisdictional	42.419686	-79.152518	2	201
A509	10, 11	DP-760	Jurisdictional	42.475424	-79.149576	3	612
A510	7	DP-776	Jurisdictional	42.490378	-79.151209	2	267
A511	2	DP-782	Jurisdictional	42.508356	-79.157319	9	295
B1	56	NA	Jurisdictional	42.410968	-79.127812	NA	123
C1	56	NA	Jurisdictional	42.411426	-79.128459	NA	724
D1	54	NA	Jurisdictional	42.417940	-79.131995	NA	144
E1	79	DP-264	Jurisdictional	42.407655	-79.140498	28	132
F1	95	NA	Jurisdictional	42.401701	-79.163952	NA	1,193
G1	96	DP-237	Jurisdictional	42.406874	-79.164070	9	2,307
H1	96	NA	Jurisdictional	42.408615	-79.164221	NA	92
I1	92	NA	Jurisdictional	42.397870	-79.163197	NA	831

Notes:

*Jurisdiction classifications provided represent the professional opinion of Fisher Associates. For approval of these classifications, a request for Jurisdictional Determination should be made to the US Army Corps of Engineers. Classification as a jurisdictional ditch herein is based on the presence of a defined bed and bank, an ordinary high water mark (OHWM), a direct or indirect connection to a traditional navigable water (TNW), and at least one of the following supplementing attributes:

a) Presence of relatively permanent flowing or standing water;
b) A natural stream that has been altered;
c) Excavated in a jurisdictional waters of the US (WOTUS);
d) Connects two or more jurisdictional WOTUS; or
e) Drains natural water bodies (including wetlands) into a tributary system of a TNW.

Ditches are not regulated by the New York State Department of Environmental Conservation unless they are determined to be altered natural tributaries possessing a state-regulated classification and/or standard designation.

APPENDIX A
WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/27/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-13

Investigator(s): DTL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): depressions Local relief (concave, convex, none): Concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR-R Lat: 79.12771 Long: 42.410771 Datum: NAD 83

Soil Map Unit Name: Achville Silt loam (As) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: C2

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): <1"
Water Table Present?	Yes X	No ____	Depth (inches): 4"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 13

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eleocharis sp.	40	YES	FAC
2. Scirpus atrovirens	20	YES	OBL
3. Panicum capillare	15	NO	FAC
4. Juncus canadensis	10	NO	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		42.5
Woody Vine Stratum (Plot size: 30')			17
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	95	7.5YR 3/4	5	C	M	Clay loam	
10-18	10YR 5/2	90	7.5YR 5/6	10	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/27/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-4

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.127187 Long: 42.410757 Datum: NAD 83

Soil Map Unit Name: Fite silt loam (ErB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants. Sampling Point: DP-14

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago gigantea	20	Yes	FACW
2. Plantago lanceolata	20	Yes	FACU
3. Dactylis glomerata	20	Yes	FACU
4. Panicum capillare	20	Yes	FAC
5. Plantago major	20	Yes	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		50 20
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
Ap 0-9	10YR 4/3	100	—	—	—	—	Silt loam	
9-18	10YR 4/3	95	7.5YR 5/6	5	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/27/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-15

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.128182 Long: 42.411681 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-D7

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 4"
Water Table Present?	Yes X	No ____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-15

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	40	YES	FACW
2. Carex Sp.	30	YES	FAC
3. Scirpus atrovirens	20	YES	OBL
4. Juncus canadensis	20	YES	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: 30')			55 22
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	95	7.5YR 3/4	5	C	M	Si Loam	
10-18	2.5Y 5/2	90	7.5YR 5/8	10	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/27/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-6

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.128281 Long: 42.411499 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (EeB NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland Hydrology Indicators Present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-16

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Trifolium pratense	60	Yes	FACU
2. Phleum pratense	10	Yes	FACU
3. Plantago lanceolata	10	Yes	FACU
4. Taraxacum officinale	10	Yes	FACU
5. Elymus repens	5	No	FACU
6. Hesperis sp.	5	No	FAC
7. Galium sp.	5	No	FAC
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		52.5
Woody Vine Stratum (Plot size: 30')			11
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 10 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

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Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
Ap 0-9	10YR 4/3	100	—	—	—	—	Silt loam	
9-18	10YR 4/3	95	7.5YR 4/6	5	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/28/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 19

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Depressions Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR-R Lat: 79.141774 Long: 42.422162 Datum: NAD 83

Soil Map Unit Name: Ashville Silt loam (As) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-F7

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): < 1"
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 19

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americana	10	YES	FACW
2. Acer rubrum	10	YES	FAC
3. Fraxinus pennsylvanica	10	YES	FACW
4.			
5.			
6.			
7.			
	= Total Cover	15	6

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus amomum	10	YES	FACW
2. Viburnum dentatum	10	YES	FAC
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover	10	4

Herb Stratum (Plot size: 5')			
1. Viola sp.	40	YES	FAC
2. Solidago altissima	30	YES	FAC
3. Onoclea sensibilis	15	NO	FACW
4. Equisetum sp.	15	NO	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover	50	20

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/1	90	7.5YR 3/4	10	C	M	Silt loam	
9-18	10YR 4/2	90	7.5YR 5/6	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/28/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 20

Investigator(s): DJL, VJM Section, Township, Range:

Landform (hillslope, terrace, etc.): Till plain Local relief (concave, convex, none): Convex Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: Long: Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam (ChB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-20

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Dactylis glomerata	60	YES	FACU
2. Trifolium pratense	20	YES	FACU
3. Hesperis Sp.	10	NO	FAC
4. Gallium Sp.	10	NO	FAC
5. Fragaria virginiana	5	NO	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		52.5 / 11
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	100	—	—	—	—	Silt loam	
9-20	10YR 4/4	100	—	—	—	—	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/29/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-2 I

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Depressions Local relief (concave, convex, none): Concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR-R Lat: 79.138324 Long: 42.421954 Datum: NAD 83

Soil Map Unit Name: Ashville Silt loam (As) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-G-1
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ___	Depth (inches):	<1"
Water Table Present?	Yes X No ___	Depth (inches):	4
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches):	0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-21

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	50	YES	FACW
2. Carex tribuloides	20	YES	OBL
3. Carex sp.	20	NO	FAC
4. Lycopus americanus	5	NO	OBL
5. Hypericum sp.	5	NO	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		50 20
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	95	7.5YR 3/4	5	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/29/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-22

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Depressions Local relief (concave, convex, none): Concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR-R Lat: 79.137276 Long: 42.422204 Datum: NAD 83

Soil Map Unit Name: Ashville Silt loam (As) NWI classification: PEMA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A1

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 4"
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-22

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix nigra	30	YES	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Typha angustifolia	80	YES	OBL
2. Salix nigra	10	NO	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		45/10
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes 1 No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	100	—	—	-	-	Mucky loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- X Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/29/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-23

Investigator(s): DJL, KSM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Moraines Local relief (concave, convex, none): Convex Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.135864 Long: 42.421974 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam (VsB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-23

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Dactylis glomerata	40	Yes	FACU
2. Trifolium pratense	20	Yes	FACU
3. Plantago lanceolata	20	Yes	FACU
4. Galium spp.	10	No	FACU
5. Daucus carota	10	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		50 20
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/4	100	—	—	—	—	SiL Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/2-7/25

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-24

Investigator(s): DTL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plains Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.135136 Long: 42.421977 Datum: NAD 83

Soil Map Unit Name: Busti Silt loam (BsB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-I1 & WL-I2

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 4"
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-24

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	20	Yes	FACW
2. Carex sp.	20	Yes	FAC
3. Phalaris arundinacea	20	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60 = Total Cover		3 of 12

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	90	7.5YR 4/6	10	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ✓ No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/30/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-26

Investigator(s): DTG, VSM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.144193 Long: 42.405132 Datum: NAD 83

Soil Map Unit Name: Busti Silt loam (BsA) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-J1
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No 10	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes X	No 4	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-26

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Eleocharis cyperinus	25	YES	OBL
2. Phalaris arundinacea	25	YES	FACW
3. Juncus effusus	15	YES	FACW
4. Carex canadensis	15	YES	FACW
5. Solidago altissima	10	NO	FAC
6. Onoclea sensibilis	10	NO	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/1	95	7.5YR 4/3	5	C	M	Silt loam	
9-18	10YR 5/2	80	7.5YR 5/8	20	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/30/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-27

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till plains Local relief (concave, convex, none): Convex Slope (%): 2-8

Subregion (LRR or MLRA): LRR-R Lat: 79.1438 Long: 42.40529 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam (BaB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-27

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Solidago Canadensis	40	YES	FACU
2. Dact. lis glomerata	30	YES	FACU
3. Lotus corniculatus	20	NO	FACU
4. Fragaria virginiana	10	NO	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		50 20

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	100	—	—	—	—	Silt loam	
9-18	10YR 3/4	100	—	—	—	—	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/02/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-29

Investigator(s): DJL, KJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till plain Local relief (concave, convex, none): Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.146669 Long: 42.407603 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam (ChB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-J2

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): <1
Water Table Present?	Yes X	No ____	Depth (inches): 3
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Leersia oryzoides	70	YES	OBL
2. Juncus effusus	20	YES	FACW
3. Epilobium sp.	10	NO	FAC
4. Verbena hastata	5	NO	FACW
5. Lycopus americanus	5	NO	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110 = Total Cover		55 22
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 – 10	G1 4/10Y	90	7.5YR 3/4	10	C	M	SiLv clay loam	
10-20	G2 4/10Y	95	7.5YR 4/6	5	C	M	SiLv clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/02/201

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 29

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 8 - 15

Subregion (LRR or MLRA): LRR-R Lat: 79.146449 Long: 42.407621 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt loam (CkC) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes _____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No Wetland Hydrology Indicators Present

VEGETATION – Use scientific names of plants. Sampling Point: DP-29

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	70	YES	FACU
2. Dactylis glomerata	60	YES	FACU
3. Sonchus arvensis	15	NO	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	145 = Total Cover		72.5
Woody Vine Stratum (Plot size: 15')			29
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/4	100					silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/02/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-30

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.149877 Long: 42.407902 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt loam (ChB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-J3
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): <1
Water Table Present?	Yes X	No ____	Depth (inches): 3
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 30

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	60	Yes	FACW
2. Agrostis stolonifera	30	Yes	FACW
3. Phalaris arundinacea	10	NO	FACW
4. Lotus corniculatus	10	NO	FACU
5. Eutrochium purpureum	5	NO	FAC
6. Solidago sp.	5	NO	FAC
7. Epilobium sp.	5	NO	FAC
8.			
9.			
10.			
11.			
12.			
	125 = Total Cover		62.5 25
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 30

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 2/1	95	7.5YR 5/4	5	C	M	Silt loam	
9-18	10YR 5/2	90	7.5YR 4/6	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/02/2018

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 31

Investigator(s): DJC, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.M9483 Long: 42.40798 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam (ChB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland Hydrology Indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 31

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phleum Pratense	20	YES	FACU
2. Lotus Corniculatus	20	YES	FACU
3. Solidago altissima	15	YES	FACU
4. Trifolium Hatense	10	NO	FACU
5. Plantago lanceolata	10	NO	FACU
6. Achillea millefolium	5	NO	FACU
7. Potentilla pensylvanica	5	NO	FACU
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		42.5 / 17
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/3	100	—	—	—	—	Silt loam	
9-18	10YR 4/3	100	—	—	—	—	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/02/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-32

Investigator(s): DJC, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till plain Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.140529 Long: 42.407599 Datum: NAD 83

Soil Map Unit Name: Erie Silt Loam (ErB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-J4

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1) (corn)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1

Water Table Present? Yes X No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-32

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Mentha piperita	60	YES	OBL
2. Acer sp.	30	YES	FAC
3. Leersia oryzoides	30	YES	OBL
4. Juncus effusus	20	NO	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	140 = Total Cover		70 28
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 32

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/1	95	7.5YR 4/3	5	C	M	Silt loam	
9-10	10YR 3/1	90	7.5YR 5/8	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/02/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-33

Investigator(s): DSL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plains Local relief (concave, convex, none): Convex Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.140899 Long: 42.407567 Datum: NAD 83

Soil Map Unit Name: Langford Silt loam (LnB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): —
Water Table Present?	Yes ____	No X	Depth (inches): —
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): —

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-33

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Zea mays	50	YES	UPL
2. Oxalis corniculata	5	NO	FACU
3. Poa pratensis	5	NO	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60 = Total Cover		30/12

Woody Vine Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-33

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	100					Silt Loam	
7-18	10YR 5/3	95	7.5YR 5/8	5			Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 38

Investigator(s): DSL, VSM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.164889 Long: 42.399245 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-K3

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No ___	Depth (inches):
Water Table Present?	Yes X No ___	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 3a

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus amomum	5	Yes	FACW
2. Viburnum dentatum	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover	5	2

Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	90	Yes	FACW
2. Aster sp.	30	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	120 = Total Cover	60	24

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 38

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/1	90	7.5YR 3/4	~~10~~ 5	C	M	Silt Loam	
			7.5YR 5/6	5				
9-18	10YR 5/2	90	7.5YR 4/6	10	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-39

Investigator(s): DSL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.165163 Long: 42.399291 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: ~

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 39

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phleum pratense	30	YES	FACU
2. Dactylis glomerata	30	YES	FACU
3. Galium mollugo	10	NO	FACU
4. Plantago lanceolata	10	NO	FACU
5. Trifolium pratense	10	NO	FACU
6. Rhamnus cathartica	10	NO	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		50 20
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

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Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-39

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	100	—	—	—	—	Silt loam	Layer 1
9-18	10YR 4/3	95	7.5YR 5/6	5	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-40

Investigator(s): DSL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.163868 Long: 42.399489 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (EeB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-L7

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 3

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 4/6

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	30	YES	FACW
2. Mentha piperita	30	YES	OBL
3. Epilobium sp.	20	YES	FAC
4. Agrostis stolonifera	20	YES	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		50 20

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-40

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/1	90	7.5YR 3/4	10	C	M	Silt loam	
9-18	10YR 5/1	90	7.5YR 5/8	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 4/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-41

Investigator(s): DSL, VSM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.163678 Long: 42.399905 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ND, Soil No, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes	No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 41

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Viburnum dentatum	30	YES	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago altissima	70	YES	FAC
2. Microstegium vimineum	50	YES	FACU
3. Parthenocissus quinquefolia	20	NO	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	140 = Total Cover		70 28
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-41

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/4	100					SiL	
9-18	10YR 4/4	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2011

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-42

Investigator(s): DSL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.163634 Long: 42.402515 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-L2

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No 6 Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No 0 Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-42

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Scirpus cyperinus	15	YES	OBL
2. Juncus effusus	5	NO	FACW
3. Daucus carota	1	NO	UPL
4. Phleum pratense	1	NO	FACU
5. Epilobium sp.	5	NO	FAC
6. Onoclea sensibilis	30	YES	FACW
7. Mesperis sp.	5	NO	FAC
8. Viburnum dentatum	10	NO	FAC
9. Aster sp.	10	NO	FAC
10. Agrostis stolonifera	15	YES	FACW
11. Carex vulpinoidea	5	NO	OBL
12.			
	102 = Total Cover		51 / 20.1

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR 3/1	95	7.5YR 3/4	5	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-43

Investigator(s): DJL VSM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.163785 Long: 42.402635 Datum: NAD 83

Soil Map Unit Name: Erie Silt Loam (ErB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology Indicators present

VEGETATION – Use scientific names of plants. Sampling Point: DP-43

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Dactylis glomerata	40	YES	FACU
2. Phleum pratense	40	YES	FACU
3. Solidago altissima	20	NO	FACU
4. Aster sp.	10	NO	FAC
5. Viburnum lantana	10	NO	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	120 = Total Cover		60 24
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 43

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/3	100	—	—	—	—	Silt loam	
9-18	10YR 5/3	95	7.5YR 5/6	5	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 44

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.164454 Long: 42.406188 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-M1

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-44

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	40	YES	FACW
2. Scirpus cyperinus	30	YES	OBL
3. Lotus corniculatus	10	NO	FACU
4. Hesperis sp.	5	NO	FAC
5. Phalaris arundinacea	20	NO	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		52.5 21
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-44

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/1	90	7.5YR 3/4	10	C	M	Silt loam	
9-18	10YR 5/2	90	7.5YR 5/6	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-45

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.164174 Long: 42.406104 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErC) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present.

VEGETATION – Use scientific names of plants. Sampling Point: DP-15

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Hesperis sp.	10	NO	FACU
2. Plantago lanceolata	5	NO	FACU
3. Trifolium pratense	10	NO	FACU
4. Lotus corniculatus	10	NO	FACU
5. Fragaria virginiana	5	NO	FACU
6.			
7. Phleum pratense	60	YES	FACW
8. Dactylis glomerata	30	YES	FACU
9.			
10.			
11.			
12.			
	130 = Total Cover	65	26

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DP-45

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/3	100	—	—	—	—	Silt Loam	
9-18	10YR 5/3	90	7.5YR 5/6	10	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No +

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-WL6

Investigator(s): DTG, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.164153 Long: 42.408373 Datum: NAD 83

Soil Map Unit Name: Erie silt loam (ErC) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-N1

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 5

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-46

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix sp.	10	YES	FAC
2. Fraxinus pennsylvanica	5	YES	FACW
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		7.5 3
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus amomum	20	YES	FACW
2. Salix sp.	15	YES	FAC
3.			
4.			
5.			
6.			
7.			
	35 = Total Cover		17.5 7
Herb Stratum (Plot size: 5')			
1. Typha latifolia	30	YES	OBL
2. Solidago altissima	30	YES	FAC
3. Equisetum sp.	25	YES	FAC
4. Aster sp.	20	NO	FAC
5. Agrostis alba	15	NO	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	120 = Total Cover		60 24
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 106 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-4/6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	95	7.5YR 5/6	5	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-47

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.164256 Long: 42.408546 Datum: NAD 83

Soil Map Unit Name: Kae Silt loam (KeB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 47

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	10	YES	FAC
2. Malus sp.	10	YES	FACU
3. Fraxinus pennsylvanica	10	YES	FACW
4.			
5.			
6.			
7.			
	30 = Total Cover		15 / 6
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	70	YES	FACU
2. Aster sp. (Calico)	30	YES	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		50 / 20
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-47

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2	100	—	—	—	—	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-48

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.165017 Long: 42.409849 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-01

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-48

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	40	Yes	FACW
2. Scirpus cyperinus	30	Yes	OBL
3. Epilobium sp	25	Yes	FAC
4. Aster sp	20	No	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	115 = Total Cover	57.5	33
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-48

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/1	90	7.5YR 3/4	10	C	M	silt loam	
9-16	10YR 4/1	90	7.5YR 5/6	10	C	M	silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 49

Investigator(s): DJL, VJM Section, Township, Range: V. Ellicott

Landform (hillslope, terrace, etc.): Till plain Local relief (concave, convex, none): Convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.165424 Long: 42.409897 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam (CkB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes X	No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes X	No ____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 6

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 49

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Rosa multiflora	30	Yes	FACU
2. Lotus corniculatus	30	Yes	FACW
3. Acer spp	20	Yes	FAC
4. Solidago altissima	20	No	FACU
5. Hesperis sp.	5	No	FACU
6. Fragaria virginiana	5	No	FACU
7. Vaccinium glaucoata	5	No	FACU
8.			
9.			
10.			
11.			
12.			
	115 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 49

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100	—	—	—	—	SiLt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04, 2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-52

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.155498 Long: 42.401663 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** Yes X No ___
Hydric Soil Present?	Yes X	No ___	If yes, optional Wetland Site ID: WL-Q7
Wetland Hydrology Present?	Yes X	No ___	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 52

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Salix sp.	45	Yes	FAC
2. Fraxinus pennsylvanica	20	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	65 = Total Cover		325/13

Herb Stratum (Plot size: 5')			
1. Aster sp.	30	Yes	FAC
2. Poa sp.	30	Yes	FAC
3. Solidago altissima	20	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		40/16

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 84 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 52

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR3/1	90	7.5YR 3/4	10	C	M	Silt loam	
9-18	10YR4/1	90	7.5YR 5/8	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-53

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.165726 Long: 42.401561 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: ~

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland Hydrology Indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-53

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	45	YES	FACU
2. Betula alleghaniensis	10	NO	FAC
3. Acer saccharum	20	YES	FACU
4.			
5.			
6.			
7.			
	75	= Total Cover	375 / 15

Sapling/Shrub Stratum (Plot size: 15')			
1. Betula alleghaniensis	10	YES	FAC
2. Tsuga canadensis	10	YES	FACU
3. Fagus grandifolia	10	YES	FACU
4.			
5.			
6.			
7.			
	30	= Total Cover	15 / 6

Herb Stratum (Plot size: 5')			
1. Rubus allegheniensis	30	YES	FACU
2. Dryopteris	10	NO	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	20 / 8

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 17% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-53

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100	—	—	—	—	Loam	
2-4	10YR 2/1	100	—	—	—	—	Loam	
4-10	10YR 4/4	100	—	—	—	—	Si Loam	
10-20	10YR 4/3	95	7.5YR 5/6	5	C	M	Si Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-55

Investigator(s): DTL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.157 Long: 42.399607 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-KI

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 9
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-55

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Agrostis alba	60	YES	FACW
2. Phleum pratense	20	YES	FACU
3. Glyceria sp.	20	YES	FAC
4. Juncus effusus	20	YES	FACW
5. Scirpus cyperinus	10	NO	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	130 = Total Cover		65/26
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-55

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	90	7.5YR 3/4	10	C	M	Silt loam	
9-18	10YR 4/2	90	7.5YR 5/6	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-56

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.157362 Long: 42.399638 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 56

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago altissima	30	YES	FACU
2. Daucus carota	20	YES	FACU
3. Phleum pratense	20	YES	FACU
4. Dactylis glomerata	20	NO	FACU
5. Achillea millefolium	10	NO	FACU
6. Acer sp.	10	NO	FAC
7. Lotus corniculatus	10	NO	FACU
8. Fragaria virginiana	10	NO	FACU
9. Agrostis stolonifera	5	NO	FACW
10.			
11.			
12.			
	135 = Total Cover		67.5 27
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-56

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/3	95	7.5YR 3/4	5	C	M	Silt loam	
3-18	10YR 4/4	100	—	—	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: No hydric soil indicators present

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-57

Investigator(s): DTL VTN Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till plain Local relief (concave, convex, none): Concave Slope (%): 3-6

Subregion (LRR or MLRA): LRR-R Lat: 79.162664 Long: 42.399693 Datum: NAD 83

Soil Map Unit Name: Erie Silt Loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID: WL-57	
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 5

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-57

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Agrostis stolonifera	30	YES	FACW
2. Juncus effusus	20	YES	FACW
3. Scirpus cyperinus	10	NO	OBL
4. Acte- sp	10	NO	FAC
5. Galium mollugo	10	NO	FACU
6. Solidago altissima	20	YES	FACU
7. Rhleum palmatum	5	NO	FACU
8. Fragaria virginiana	5	NO	FACU
9. Maianthemum	5	NO	FAC
10. Lotus corniculatus	5	NO	FACU
11.			
12.			
	120 = Total Cover		60/24

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-57

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	95	7.5YR 3/4	5	C	M	Silt loam	
10-18	10YR 5/2	90	7.5YR 5/6	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-58

Investigator(s): DJC, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.162977 Long: 42.399735 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____	**No** X
Hydric Soil Present?	Yes ____	No X			
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-58

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	60.	YES	FACU
2. Vicia americana	40.	NO	FACU
3. Melilotus officinalis	10.	NO	FACU
4. Taraxacum officinale	10.	NO	FACU
5. Aster sp.	10.	NO	FAC
6. Fragaria virginiana	5	NO	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		52.5 2+1
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-5B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/3	95	10YR 3/4	5	C	M	Silt Loam	
9-20	10YR 4/3	95	10YR 4/6	5	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-61

Investigator(s): DSL, VSM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR-R Lat: 79.162728 Long: 42.396787 Datum: NAD 83

Soil Map Unit Name: Erie Silt loam (ErA) NWI classification: PEMy

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	If yes, optional Wetland Site ID: WL-41

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 10
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 8

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 61

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus amomum	20	YES	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	75	YES	FACW
2. Aster sp.	15	NO	FAC
3. Solidago canadensis	5	NO	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30')			47.5 19
1. Vitis riparia	10	YES	FAC
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-61

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	95	7.5YR 3/4	5	C	M	Silt loam	
12-19	10YR 5/2	90	7.5YR 5/6	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-62

Investigator(s): DJL, WJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.162906 Long: 42.396833 Datum: NAD 83

Soil Map Unit Name: Erie Silt Loam (EeA) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

- No water table present within 20"
- No saturation present within 20"
- Soil moist but no wetland hydrology indicators observed

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 62

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phleum pratense	30	YES	FACU
2. Dactylis glomerata	30	YES	FACU
3. Hesperis sp.	5	NO	FAC
4. Trifolium pratense	15	YES	FACU
5. Taraxacum officinale	5	NO	FACU
6. Plantago lanceolata	5	NO	FACU
7. Bromus arvensis	15	YES	FACU
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		52.5
Woody Vine Stratum (Plot size: 30')			11
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 62

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	90	7.5YR 3/4	10	C	M	Silt loam	
10-20	10YR 5/2	90	7.5YR 3/4	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/05/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 64

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plains Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.12463 Long: 42.428515 Datum: NAD 83

Soil Map Unit Name: Busti Silt loam (BuB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No ___	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 6

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-64

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix sp	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Scirpus cyperinus	40	Yes	OBL
2. Carex lurida	30	Yes	OBL
3. Juncus effusus	10	No	FACW
4. Onoclea sensibilis	10	No	FACW
5. Aster sp.	5	No	FAC
6. Hesperis	5	No	FAC
7. Fragaria virginiana	5	No	FACU
8. Carex sp.	5	No	FAC
9.			
10.			
11.			
12.			
	110 = Total Cover		55 22
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 64

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	90	7.5YR 3/4	10	C	M	Silt loam	
8-18	10YR 5/2	80	7.5YR 5/6	20	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/05/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-65

Investigator(s): DJL, WJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plains Local relief (concave, convex, none): Convex Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.124129 Long: 42.428681 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam (BsB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes	No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 6

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	90	YES	~~FACW~~
2.			
3.			
4.			
5.			
6.			
7.			
	90 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Carpinus caroliniana	60	YES	FAC
2. Malus sp.	10	NO	~~FACU~~
3. Amelanchier sp.	10	NO	~~FAC~~
4. Fraxinus pennsylvanica	10	NO	~~FACW~~
5. Crataegus sp.	5	NO	~~FAC~~
6.			
7.			
	95 = Total Cover		47.5 / 19

Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-6S

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100	—	—	—	—	Si/H loam	
6-18	10YR 5/3	90	7.5YR 5/8	10	C	M	Si/H loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/06/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-74

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.127372 Long: 42.429137 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt loam (ChC) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-V3

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 4
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-74

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix sp.	80	YES	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	80 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago sempervirens	20	YES	FACW
2. Leersia oryzoides	10	YES	OBL
3. Onoclea sensibilis	5	NO	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	35 = Total Cover		17.5
Woody Vine Stratum (Plot size: 30')			7
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 74

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR3/1	90	7.5YR3/4	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/06/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-75

Investigator(s): DJL, VJM Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 3-4

Subregion (LRR or MLRA): LRR-R Lat: 79.127418 Long: 42.429002 Datum: NAD 83

Soil Map Unit Name: Busti Silt loam (BsB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	**Yes** ____	**No** X
Hydric Soil Present?	Yes ____	No X			
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-75

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus Serotina	30	YES	FACU
2. Acer saccharum	10	NO	FACU
3. Malus sp.	20	YES	FACU
4.			
5.			
6.			
7.			
	60 = Total Cover		30 12

Sapling/Shrub Stratum (Plot size: 15')			
1. Prunus serotina	30	YES	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Solida go altissima	30	YES	FACU
2. Rubus allegheniensis	10	YES	FACU
3. Pteridium aquilinum	10	NO	FACU
4. Fragaria virginiana	10	NO	FACU
5. Phleum pratense	10	NO	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		35 14

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 75

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/4	100	—	—	—	—	Si/L/loam	
5-18	10YR 4/4	100	—	—	—	—	Si/L/loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/14/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-77

Investigator(s): DTC Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR-R Lat: 79.133863 Long: 42.433703 Datum: NAD 83

Soil Map Unit Name: Ashville silt loam (As) NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	If yes, optional Wetland Site ID: WL-W7
Wetland Hydrology Present?	Yes X	No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 2
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	5	Yes	FACW
2. Betula alleghaniensis	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		5 2
Sapling/Shrub Stratum (Plot size: 15')			
1. Ulmus americana	10	Yes	FACW
2. Betula alleghaniensis	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		10 4
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	30	Yes	FACW
2. Viola sp.	20	Yes	FAC
3. Sphagnum sp.	10	No	OBL
4. Carex sp.	5	No	FAC
5. Carex sp.	5	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		35 14
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-77

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100	-	-	-	-	Silt loam	
2-18	10YR 5/2	95	7.5YR 4/6	5	C	M	clay loam	frag pan

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/1/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-73

Investigator(s): DTL Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 2-3

Subregion (LRR or MLRA): LRR-R Lat: 79.133805 Long: 42.433552 Datum: NAD 83

Soil Map Unit Name: (CB=A) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-78

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	50	Yes	FACU
2. Fraxinus pennsylvanica	20	Yes	FACW
3. Prunus serotina	5	No	FACU
4. Tsuga canadensis	5	No	FACU
5. Betula alleghaniensis	5	No	FAC
6.			
7.			
	85	= Total Cover	47.5

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	30	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-7B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/3	100	—	—	—	—	SiLt loam	
8-19	10YR 5/6	100	—	—	—	—	SiLt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/11/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-79

Investigator(s): DJL Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR-R Lat: 79. Long: 42. Datum: NAD 83

Soil Map Unit Name: Busti Silt loam (BsA) NWI classification: PEMA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: WL-V4
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ✓ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No ____	Depth (inches): 6
Water Table Present?	Yes ✓	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-79

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	90	Y	FACW
2. Juncus effusus	5	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

4/5/19

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 77

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/1	85	7.5YR 5/4	5	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/11/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 80

Investigator(s): DJL Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 0 - 3

Subregion (LRR or MLRA): LRR-R Lat: 79. Long: 42. Datum: NAD 83

Soil Map Unit Name: Busti Silt loam (BsA) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 90

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Plantago lanceolata	60	Yes	FACU
2. Lotus corniculatus	30	Yes	FACU
3. Fragaria virginiana	20	No	FACU
4. Daucus carota	10	No	FACU
5. Hesperis sp.	5	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	125 = Total Cover		67.5

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-80

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/4	100	—	—	—	—	Silt loam	
9-12	10YR 4/4	100	—	—	—	—	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock/Gravel

Depth (inches): 12"

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/11/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-31

Investigator(s): DSL Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): till plain Local relief (concave, convex, none): concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.133101 Long: 42.432769 Datum: NAD 83

Soil Map Unit Name: Chenango silt loam (CnB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-X1

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 18+
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Former ag ponds that drain to wetland associated with Stream ST-15

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 81

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Leersia oryzoides	20	Yes	OBL
2. Scirpus cyperinus	20	Yes	OBL
3. Typha sp.	10	No	OBL
4. Sparganium sp.	10	No	OBL
5. Lemna sp.	5	No	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		225 / 13
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 81

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

Mucky soils Strong hydrogen sulfide odor detected

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/11/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-82

Investigator(s): DJL Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Fill Plain Local relief (concave, convex, none): Convex Slope (%): 1-8

Subregion (LRR or MLRA): LRR-R Lat: 79.1334 Long: 42.432916 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam (CkB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes Y No ____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?**	Yes ____	No X
Hydric Soil Present?	Yes ____	No X			
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-02

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	60	Yes	FACU
2. Fraxinus pennsylvanica	30	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	90 = Total Cover		45

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	30	Yes	FACU
2. Malus sp.	10	No	FACW
3.			
4.			
5.			
6.			
7.			
	40 = Total Cover		20

Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/4	100	—	—	—	—	Silt loam	
10-18	10YR 3/6	100	—	—	—	—	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/12/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-86

Investigator(s): M. Boberg D. Lockwood Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.128943 Long: 42.433243 Datum: NAD 83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-42
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0-5"
Water Table Present?	Yes X	No ___	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 8b

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	90	Y	FACU
2. Betula alleghaniensis	10	N	FAC
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	40	Y	FACU
2. Betula alleghaniensis	30	Y	FAC
3.			
4.			
5.			
6.			
7.			
	70	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Osmunda cinnamonea	5	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	40	x 3 =	120
FACU species	130	x 4 =	520
UPL species	0	x 5 =	0
Column Totals:	175 (A)		650 (B)

Prevalence Index = B/A = 3.71

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

species have adapted to wet conditions through morphological adaptations – fluted trunks and shallow roots.

- Eastern Hemlock

SOIL

Sampling Point: DP- 86

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 2.5/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/12/13

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-87

Investigator(s): M. Boberg D. Lockwood Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 35

Subregion (LRR or MLRA): LRR-R Lat: 79.128876 Long: 42.433416 Datum: NAD 83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes Y No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 87

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	90	Y	FACU
2. Betula alleghaniensis	10	N	FAC
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	10	Y	FACU
2. Betula alleghaniensis	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Dryopteris cristata	5	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	125 (A)		465 (B)

Prevalence Index = B/A = 3.72

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 87

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2								leaf litter
0-1	2.5Y 2.5/1	100						
1-2	2.5Y 4/1	100						
2-12	2.5Y 4/4	80	2.5Y 4/1	5	D	M	SIL	
			10YR 4/6	5	C	M	SIL	
			2.5Y 7/3	10	C	M	SIL	
12-20	2.5Y 5/6	80	2.5Y 7/3	10	C	M	SIL	
			10YR 4/6	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/2/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 91

Investigator(s): DJL, MAE Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79, 121921 Long: 42.439258 Datum: NAD 83

Soil Map Unit Name: Alden mucky silt loam (Ad) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A5

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches):	4
Water Table Present?	Yes X	No ____	Depth (inches):	0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches):	0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Leersia oryzoides	70	YES	OBL
2. Mentha sp.	20	NO	FACW
3. Juncus effusus	10	NO	FACW
4. Nasturtium officinale	10	NO	OBL
5. Kyllinga sp.	10	NO	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	120 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

60
34

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 9/

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 2/1	95	7.5YR 3/4	5	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/12/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 92

Investigator(s): DJL, MHR Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Convex Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.121797 Long: 42.439597 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam (CkB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-92

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Festuca sp.	50	YES	FACU
2. Trifolium repens	40	YES	FACU
3. Plantago lanceolata	5	NO	FACU
4. Taraxacum officinale	5	NO	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		50 20
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-92

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/3	100						
5-16	10YR 4/4	100						
16-20	10YR 4/3	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/12/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-93

Investigator(s): DJL, MAF Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR-R Lat: 79.122045 Long: 42.440547 Datum: NAD 83

Soil Map Unit Name: Busti Silt loam (BsB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A6

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 21
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 93

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	40	YES	FACW
2. Juncus canadensis	30	YES	OBL
3. Juncus effusus	20	NO	FACW
4. Trifolium hybridum	10	NO	FACU
5. Pteridium sp.	5	NO	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		50% 21
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-93

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	90	7.5YR 3/4	10	C	M	Si/Ha	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock/Gravel

Depth (inches): 8

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/12/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 94

Investigator(s): DJL, MAB Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Linear Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 79.122055 Long: 42.440708 Datum: NAD 83

Soil Map Unit Name: Rush Silt Loam (RuA) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes	No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? Yes No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-94

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Trifolium repens	60	YES	FACU
2. Poa sp.	40	YES	FAC
3. Plantago lanceolata	20	NO	FACU
4. Taraxacum officinale	10	NO	FACU
5. Solanum carolinense	10	NO	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	140 = Total Cover		70 28
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 74

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/3	100	—	—	—	—	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock / Gravel

Depth (inches): 8

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/3/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-103

Investigator(s): DSL, MAB Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-8%

Subregion (LRR or MLRA): LRR-R Lat: 79.129245 Long: 42.441146 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam (ChB) NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-100

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina	40	Yes	FACU
2. Robinia pseudoacacia	50	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	90	= Total Cover	45

Sapling/Shrub Stratum (Plot size: 15')			
1. Prunus serotina	20	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	10

Herb Stratum (Plot size: 5')			
1. Rosa multiflora	10	Yes	FACU
2. Lonicera japonica	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	7.5

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0	= Total Cover	3

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Photos 13/

SOIL

Sampling Point: DP- 109

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/3	100	—	—	—	—	Silt loam	
3-12	10YR 4/4	100	—	—	—	—	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Stone/Gravel

Depth (inches): 12"

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/13/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-101

Investigator(s): DSL, MHB Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.12813 Long: 42.44178 Datum: NAD 83

Soil Map Unit Name: Bostwick loam (BmB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-47

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 2
Water Table Present?	Yes X	No ____	Depth (inches): 2
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-101

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	60	YES	FACW
2. Juncus effusus	10	NO	FACW
3. Scirpus atrovirens	20	YES	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		4/5 = 75
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Photo 12

SOIL

Sampling Point: DP-101

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/1	90	7.5YR 5/6	10	C	PL	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/13/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-103

Investigator(s): DJL, MAB Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-6

Subregion (LRR or MLRA): LRR-R Lat: 79.128876 Long: 42.440794 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam (ChB) NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes V No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A10
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): <1
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-105

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	40	Yes	FACW
2. Equisetum sp.	5	No	FAC
3. Scirpus atrovirens	20	Yes	FACW
4. Poa sp.	20	Yes	FAC
5. Galium sp.	10	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		47.5
Woody Vine Stratum (Plot size: 30')			19
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Photo 134

SOIL

Sampling Point: DP-103

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	90	7.5YR 3/4	10	C	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/13/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-164

Investigator(s): DJL, MAB Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Till Plain Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.128676 Long: 42.440764 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam (ChB) NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-104

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Dactylis glomerata	20	YES	FACU
2. Phleum pratense	20	YES	FACU
3. Trifolium repens	20	YES	FACU
4. Hesperis sp.	10	NO	FACU
5. Taraxacum officinale	10	NO	FACU
6. Plantago lanceolata	5	NO	FACU
7. Solanum carolinense	5	NO	FACU
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		45
Woody Vine Stratum (Plot size: 30')			15
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Photo 135

SOIL

Sampling Point: DP-104

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100	—	—	—	—	Si'l loam	
12-19	10YR 4/3	95	7.5YR 5/6	5	—	—	Si'l loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-200

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): N/A

Subregion (LRR or MLRA): LRR R Lat: 42.411117 Long: -79.128109 Datum: NAD 83

Soil Map Unit Name: As - Ashville silt loam NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A200 (PEM)

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PEM wetland community of A200. The wetland is a vegetated ditch located within an active hayfield. Ditch appears to have been excavated several years ago to provide drainage. Normal circumstances are present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ____	Depth (inches): 1"
Water Table Present?	Yes X No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Three primary & one secondary hydrologic indicator were met. Hydrology appears primarily precipitation driven with possible groundwater influence

VEGETATION – Use scientific names of plants.

Sampling Point: DP-250

Tree Stratum (Plot size: 30' x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30' x 10')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30' x 10')			
1. Phragmites australis	5890		FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30' x 10')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation criteria met via the rapid test. Vegetation plot was adjusted to account for the boundary of a representative PEM component

SOIL

Sampling Point: DP-300

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	2.5Y 3/2	100					Sandy loam	mixed w/ roots
7-10	2.5Y 3/2	98	5YR 4/6	2	C	M	Sandy loam	
10-16	10YR 5/1	90	10YR 5/8	10	C	M	Sandy loam	mixed w/ gravel
16+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 16"

Hydric Soil Present? Yes X No ___

Remarks:

Yes hydric soil indicators A11 & F3 were met

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-201

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): _____

Subregion (LRR or MLRA): LRR R Lat: 42.411387 Long: -79.128414 Datum: NAD 83

Soil Map Unit Name: ErB-Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A200 (PSS)

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PSS wetland community of WL-A200. The wetland is a vegetated ditch located within an active hayfield. Ditch appears to have been excavated several years ago to provide drainage. Normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches):

Water Table Present? Yes _____ No _____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches):

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Three primary and one secondary hydrologic indicator were met. Hydrology appears precipitation driven with a possible groundwater influence.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-30 1

Tree Stratum (Plot size: 20'x10')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 20'x10')			
1. Salix bebbiana	70%	Y	OBL
2. Populus deltoides	5%	N	FAC
3.			
4.			
5.			
6.			
7.			
	75 = Total Cover		
Herb Stratum (Plot size: 20'x10')			
1. Typha latifolia	5	Y	OBL
2. Equisetum arvense	5	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: 30'x10')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the dominance test. Vegetation plot was adjusted to account for the boundaries (representative) of the PSS component.

SOIL

Sampling Point: DP- 201

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	2.5Y 3/2	100					Sandy loam	Mixed with roots
7-10	2.5Y 3/2	98	5YR 4/6	2	C	M	Sandy loam	
10-16	10YR 5/1	90	10YR 5/8	10	C	M	Sandy loam	Mixed w/ gravel
16+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock / Bedrock

Depth (inches): 10

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicators A11 & F3 were met. Redox concentrations exhibited clear to abrupt boundaries between 7-10" with diffuse boundaries from 10"-16". Features were contemporary. Excavation refusal was noted at 16"

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-202

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR R Lat: 42.411661 Long: -79.128717 Datum: NAD 83

Soil Map Unit Name: ErB-Erie silt loam 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A200 (PFO)

Remarks: (Explain alternative procedures here or in a separate report.)
This sampling point represents the PFO community of WL-A200 Wetland is a vegetated ditch excavated to provide drainage for agricultural purposes. Disturbance is not new & normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1 - 3"

Water Table Present? Yes X No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Three primary and two secondary hydrologic indicators were met. Hydrology is precipitation driven with some groundwater influence

VEGETATION – Use scientific names of plants.

Sampling Point: DP-002

Tree Stratum (Plot size: 30' x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	60%	Y	OBL
2. Populus deltoides	30%	Y	FAC
3.			
4.			
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 30' x 10')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Herb Stratum (Plot size: 30' x 10')			
1. Equisetum arvense	20	Y	FAC
2. Typha latifolia	20%	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	

Woody Vine Stratum (Plot size: 30' x 10')			
1. N/A			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirement is met via dominance test. Vegetation plot was adjusted to account for the boundary (representative) of the wetland. ~ 60% open, standing water.

SOIL Sampling Point: DP-202

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	2.5Y3/2	100					Sandy loam	Mixed w/roots
7-10	2.5Y3/2	98	5YR4/6	2	C	M	Sandy loam	
10-16	10YR5/1	90	10YR5/8	10	C	M	Sandy Clay loam	Mixed w/gravel
16+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F3 was met. Rock refusal was noted at 16" with each attempt. Refusal layer is partially restricting water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5-19-2016

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 203

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): None Slope (%): 8

Subregion (LRR or MLRA): LRR R Lat: 42.413148 Long: -79.130055 Datum: NAD 83

Soil Map Unit Name: LnC – Lordstown silt loam, 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the upland community surrounding WL-A300. The sampling point is located within an active hayfield under agriculture for several years. Normal circumstances are present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators present at sample point.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-203

Tree Stratum (Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Trifolium pratense	40	Y	FACU
2. Taraxacum officinale	30	Y	FACU
3. Phleum pratense	5	N	FACU
4. Trifolium repens	5	N	FACU
5. Plantago lanceolata	5	N	FACU
6. Arctium minus	5	N	FACU
7. Dactylis glomerata	5	N	FACU
8. Phalaris arundinacea	5	N	FACW
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 5')			
1. Not Applicable			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Sampling point located within an upland. Hydrophytic vegetation requirements not met.

SOIL

Sampling Point: DP- 203

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	5Y 4/1	100					Silt loam	
10+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

no hydric soil indicators met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-204

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR or MLRA): LRR R Lat: 42.413473 Long: -79.134058 Datum: NAD 83

Soil Map Unit Name: ErB - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A201

Remarks: (Explain alternative procedures here or in a separate report.)
This sample point represents the PEM wetland community of WL A-201. The system represents a mosaic system with approximately 5% upland inclusions exhibiting pit & mound topography in locations. Chapter 5 of the NCNE Problematic Vegetation was utilized.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
One primary and four secondary hydrologic indicators were met. Hydrology is unique & may be resulting from agricultural tiles located on an adjacent property. Location of tiles was not observed. Other alterations may be contributing. Hydrology is likely precipitation influenced / water levels & precipitation amounts are lower than normal

VEGETATION – Use scientific names of plants.

Sampling Point: DP-304

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago rugosa	50	Y	FAC
2. Symphyotrichum prenanthoides	25	Y	FAC
3. Veratrum viride	10	N	FACW
4. Impatiens capensis	10	N	FACW
5. Rubus idaeus	5	N	FACU
6. Onoclea sensibilis	2	N	FACW
7. Packera aurea	2	N	FACW
8.			
9.			
10.			
11.			
12.			
	104 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements were met via the dominance test. Vegetation was analyzed via a mosaic as outlined in Chapter 5. Adjacent upland mounds & subsequent tree coverage were analyzed separately

SOIL

Sampling Point: DP- 204

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					loam	
10-20	10YR 4/2	80	7.5YR 5/6	20	C	M	Silty clay loam	Mixed with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicators A11 & F3 were met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-205

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): mound Local relief (concave, convex, none): Convex Slope (%): 8

Subregion (LRR or MLRA): LRR R Lat: 42.413406 Long: -79.133800 Datum: NAD 83

Soil Map Unit Name: ErB - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the 25% upland mounds located within WL-A02, a mosaic wetland community.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators were met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-305

Tree Stratum (Plot size: 10' x 7')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	70%	Y	FACU
2. Acer saccharum	20%	Y	FACU
3. Fraxinus americana	10%	N	FACU
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 10' x 7')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Herb Stratum (Plot size: 10' x 7')			
1. Maianthemum canadense	20%	Y	FACU
2. Caulophyllum thalictroides	10%	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

Woody Vine Stratum (Plot size: 10' x 7')			
1. N/A			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements were not met. Vegetation plot was adjusted to the boundaries of a representative mound. Absolute cover represents cover of mound & excludes adjacent PEM wetland.

SOIL

Sampling Point: DP-205

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 3/0	100					Clay loam	
3-10	10YR 3/1	100					Silt loam	
10+								Root refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicator met. Root refusal noted at 10" with each profile attempt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-206

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Toe slope / hillslope Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR or MLRA): LRR R Lat: 42.414842 Long: -79.134159 Datum: NAD 83

Soil Map Unit Name: ErA - Erie silt loam, 0 to 3% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A202

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PEM wetland community of A202. Wetland is located adjacent to an active agricultural field. Area may have undergone disturbances in the past, but normal circumstances prevail.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1"

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

One primary & one secondary hydrologic indicator met. Precipitation levels are below average and normal climatic conditions are not present

VEGETATION – Use scientific names of plants.

Sampling Point: DP-206

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Juncus effusus	70	Y	FACW
2. Carex flava	20	Y	OBL
3. Phalaris arundinacea	5	N	FACW
4. Oxalis sensibulis	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the rapid test. Vegetative plot adjusted to a 5' r in all stratum to account for the wetland boundaries within the delineation area. * Carex species was estimated & based on conditions was determined to be wetland. No spikelets or perigynia to identify species.

SOIL

Sampling Point: DP-306

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100					Silty Clay Loam	Mixed with roots
16+								Root refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Soil has roots mixed in the profile down to ~12" and would indicate the soil was historically altered. The problematic soils of chapter 3 of the NCNE regional supplement was used to determine if the soil was hydric. The soil was disturbed (tilled) as evidenced by roots & vegetative matter noted to 12". If not for the disturbance, the soil would likely exhibit a hydric soil indicator based on the landscape position, noted hydrology & hydrophytic vegetation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-207

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): 8-15%

Subregion (LRR or MLRA): LRR R Lat: 42.415477 Long: -79.134268 Datum: NAD 83

Soil Map Unit Name: ErB - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the upland community surrounding WL's A-202A A-203. Area is located in a hay field. Normal circumstances are present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-107

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Dactylis glomerata	60	Y	FACU
2. Solidago canadensis	30	Y	FACU
3. Phleum pratense	5	N	FACU
4. Bromus inermis	5	N	UPL
5. Taraxacum officinale	5	N	FACU
6. Daucus carota	3	N	UPL
7.			
8.			
9.			
10.			
11.			
12.			
	107 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements not met. Sampling point is within upland

SOIL

Sampling Point: DP-207

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 4/3	100					Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicators were met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-208

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 8-15

Subregion (LRR or MLRA): LRR R Lat: 42.416260 Long: -79.134430 Datum: NAD 83

Soil Map Unit Name: LnC - Langford silt loam, 8 to 15% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A203(PEM)

Remarks: (Explain alternative procedures here or in a separate report.)
This sample point represents the PEM component of WL-A203. The system transitions into a PuBCaPSS. The PuB is NWI mapped.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 1''
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Three primary and two secondary hydrologic indicators were met. Hydrology appears to stem from a drain tile as evidenced by flowing water at the edge of an agricultural field. Precipitation levels are below average for the year.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-208

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Phalaris arundinacea	90%	Y	FACW
2. Typha latifolia	5%	N	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the rapid test. Sampling plot was modified to a 5' radius to account for the wetland boundaries and exclude adjacent uplands.

SOIL

Sampling Point: DP-308

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	97	7.5YR 4/6	3	C	M	Silt loam	
16+								Rock / Bedrock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock / Bedrock

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 met. Rock / Bedrock refusal noted at 16" with each attempt. Refusal layer is serving to restrict or partially restrict water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-209

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 8

Subregion (LRR or MLRA): LRR R Lat: 42.416689 Long: -79.134347 Datum: NAD 83

Soil Map Unit Name: LnC - Langford silt loam, 8 to 15% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL-A203(PSS)

Remarks: (Explain alternative procedures here or in a separate report.)

This sampling point represents the PSS component of WL-A203. The wetland community within a mapped PUB (NWI) & WL-A203PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1-4"

Water Table Present? Yes X No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Three primary and two secondary hydrologic indicators met. Hydrology appears to stem from both precipitation & groundwater.

Precipitation levels are below average.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-309

Tree Stratum (Plot size: 30 x 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30x30')			
1. Salix bebbiana	20%	Y	FACW
2. Alnus incana	15	Y	FACW
3.			
4.			
5.			
6.			
7.			
	35 = Total Cover		
Herb Stratum (Plot size: 30'x30')			
1. Eupatorium perfoliatum	30	Y	FACW
2. Impatiens capensis	30	Y	FACW
3. Symphyotrichum puniceum	20	Y	OBL
4. Onoclea sensibilis	10	N	FACW
5. Phalaris arundinacea	10	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30'x30')			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation criteria met via the rapid test. Sampling plat was modified to account for a representative boundary of the wetland and excluded adjacent upland.

SOIL

Sampling Point: DP-209

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR3/1	97	7.5YR4/6	3%	C	M	Silt loam	
16+								Rock / Bedrock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock / Bedrock

Depth (inches): 16"

Hydric Soil Present? Yes X No ___

Remarks:

9d hydric soil indicator F6 met. Redox concentrations exhibited diffuse boundaries and were contemporary features. Refusal layer is serving to restrict or partially restrict water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-31

Investigator(s): Zsiros, Jaime Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 3-5

Subregion (LRR or MLRA): LRR R Lat: 42.417370 Long: -79.137143 Datum: NAD 83

Soil Map Unit Name: ErB - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point was taken within the floodplain of ST-A200-INT. The area exhibited some hydrophytic vegetation, but did not exhibit hydrology (natural or problematic) or hydric soils (natural or problematic) as outlined in Chapter 5 of the NCNE Regional Manual.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators were met.

VEGETATION – Use scientific names of plants. Sampling Point: DP-2/2

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Rubus idaeus	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		

Herb Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Symphyotrichum prenanthoides	40	Y	FAC
2. Impatiens capensis	30	Y	FACW
3. Arctium minus	20	Y	FACU
4. Dennstaedtia punctilobula	5	N	UPL
5. Euthamia graminifolia	5	N	FAC
6. Onoclea sensibilis	2	N	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	102 = Total Cover		

Woody Vine Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 =
FACW species	2	x 2 = 4
FAC species	2	x 3 = 6
FACU species	2	x 4 = 8
UPL species	1	x 5 = 5
Column Totals:	7 (A)	23 (B)

Prevalence Index = B/A = 3.28

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements was not achieved/ Identified vegetation is frequently found growing in both wetland & upland conditions & in the absence of hydric soils & hydrology are not reliable indicators of a wetland.

SOIL

Sampling Point: DP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/3	100					Clay loam	
16+							Rock	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 16"

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicators were met. The soil was analyzed in several locations for layers of sand deposition that would be expected from the adjacent stream topping its banks thereby frequently flooding the area. No evidence of this was observed. It was determined that redox concentrations are not inhibited by the constant process of alluvial (or new soil) as outlined in Chapter 5

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-213

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRR R Lat: 42.417422 Long: -79.137526 Datum: NAD 83

Soil Map Unit Name: ErB - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A204

Remarks: (Explain alternative procedures here or in a separate report.)
This sample point represents the PEM wetland community of WL-A204. The wetland is along an existing access road and includes large pockets of standing water. Normal circumstances are present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1-6"

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Two primary and one secondary hydrologic indicator met. Hydrology is precipitation driven.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-213

Tree Stratum (Plot size: 30 x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30 x 10')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30 x 10')			
1. Onoclea sensibilis	5	N	FACW
2. Phalaris arundinacea	5	N	FACW
3. Carex flava	15	Y	OBL
4. Euthamia graminifolia	5	N	FAC
5. Solidago rugosa	5	N	FAC
6. Poa compressa	5	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: 30 x 10')			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the rapid test. Large component of wetland is standing water with little vegetation. Sampling point was adjusted to account for a representative area of the wetland boundary.

SOIL

Sampling Point: DP-213

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	98	10YR 4/6	2	C	M	Silty	Clay loam
4-13	10YR 4/2	95	5YR 3/3	5	C	M	Silty	Clay loam
13+								Bedrock/Refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: Rock/Bedrock
Depth (inches): 13

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicators A11 & F3 present

Redox concentrations were faint to distinct between 0-4" with diffuse boundaries

Redox concentrations between 4-13 exhibited sharp boundaries.

Based on hydrology & wetland vegetation features are assumed contemporary.

Refusal layer is serving to partially or completely restrict water percolation

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-214

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Undulating Slope (%): 3-5

Subregion (LRR or MLRA): LRR R Lat: 42.417896 Long: -79.138432 Datum: NAD 83

Soil Map Unit Name: ErB - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A205

Remarks: (Explain alternative procedures here or in a separate report.)
This sample point represents the PFO wetland community of WL-A205.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- X Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ____	Depth (inches): 1 - 3"
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Two primary and two secondary hydrologic indicators met. Hydrology source is unknown, but may be resulting from ag tile, & is likely precipitation driven. The area has not received significant rainfall and is drier than what would be expected for this system.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 2/4

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula alleghaniensis	40	Y	FAC
2. Fraxinus americana	25	Y	FACU
3. Tsuga canadensis	10	N	FACU
4. Fagus grandifolia	5	N	FACU
5.			
6.			
7.			
	80 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Rudbeckia aurea	80	Y	FACW
2. Impatiens capensis	10	N	FACW
3. Dennstaedtia punctilobula	2	N	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	92 = Total Cover		

Woody Vine Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.6% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Betula & Fraxinus roots are buttressed and include moss trim lines.
Hydrophytic vegetation requirements met via the dominance test.

SOIL Sampling Point: DP- 214

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/1	100		100			Sandy loam	
7-11	10YR 5/2	90	10YR 5/8	10	C	M	Silty clay loam	
11+							Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Clay Loam

Depth (inches): 11

Hydric Soil Present? Yes X No ___

Remarks:

Redox concentrations exhibited diffuse to clear boundaries. The soil fell short of meeting F3 by 3 inches due to an encountered restrictive layer. Documented layer is serving to perch the water table & restrict water percolation. A hydric soil is assumed based on the presence of hydrology & vegetation in accordance with the problematic soil section, Chapter 5 of the NCNE Regional Supplement.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-215

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Undulating Slope (%): 0

Subregion (LRR or MLRA): LRR R Lat: 42.417904 Long: -79.137690 Datum: NAD 83

Soil Map Unit Name: ErB-Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

This sample points provides an upland sample point to WL. A204 & 205. Sampling area was a Tsuga / Betula forest.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No ____	Depth (inches):
Water Table Present?	Yes ____ No ____	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No ____	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-9/2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula alleghaniensis	80	Y	FAC
2. Tsuga canadensis	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer pensylvanicum	10	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Dennstaedtia punctilobula	15	Y	UPL
2. Maianthemum canadense	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements were not met. Forest ground was primarily unvegetated.

SOIL

Sampling Point: DP-215

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Silt loam	
4-8	2.5Y 4/2	100					Silty Clay loam	
8-20	2.5Y 5/6	100					Silty Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicator was met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 016

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 1 - 3

Subregion (LRR or MLRA): LRR R Lat: 42.417954 Long: -79.131952 Datum: NAD 83

Soil Map Unit Name: ErB - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes _____ No	If yes, optional Wetland Site ID:	WL - AJ06
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PEM wetland community of AJ06. The area is an isolated wetland swale

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 1''
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

One primary and two secondary hydrologic indicators met. Hydrology appears groundwater fed.

VEGETATION – Use scientific names of plants. Sampling Point: DP-016

Tree Stratum (Plot size: 10'x5')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10'x5')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 10'x5')			
1. Phalaris arundinacea	95%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 10'x5')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ✓ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the rapid test. Sampling plot was adjusted to a representative portion of the wetland & to also exclude adjacent upland vegetation

SOIL

Sampling Point: DP-216

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 5/1	90	2.5Y 6/8	10	C	M		
6+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 6"

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F3 was met. Rock refusal is serving to restrict water movement. Several attempts were made to profile the soil at depth. Rock refusal was encountered with each attempt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-224

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): undulating Slope (%): 0

Subregion (LRR or MLRA): LRR R Lat: 42.420078 Long: -79.135927 Datum: NAD 83

Soil Map Unit Name: ErB-Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A209

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PEM wetland community of WL-A209. The wetland abuts ST-A200 and ST-A202. Wetland is located in an active row crop field that has been under conversion for several years. Normal circumstances present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water levels are low and the area has received below average snowfall (winter) & precipitation (spring), resulting in drier than normal conditions.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-22Y

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Phalaris arundinacea	50	Y	FACW
2. Leersia oryzoides	20	Y	OBL
3. Juncus effusus	5	N	FACW
4. Ranunculus acris	10	N	FAC
5. Muhlenbergia schreberi	10	N	FAC
6. Trifolium repens	5	N	FACU
7. Taraxacum officinale	3	N	FACU
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirement met via the rapid test. Tree, shrub, & vine stratum modified to account for boundaries of wetland.

SOIL

Sampling Point: DP-224

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/2	98	7.5YR 4/6	2	PL	M	Sil loam	
1-6	10YR 3/2	97	7.5YR 4/6	3	PL	M	Sil loam	
6-12+	2.5Y 5/3	70	10YR 4/6	30	C	M	SiCL	rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 12

Hydric Soil Present? Yes X No ___

Remarks:

Multiple soil pits attempted, rock refusal @ 12". Partial percolation @ rocks.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-225

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 8%

Subregion (LRR or MLRA): LRR R Lat: 42.421260 Long: -79.135806 Datum: NAD 83

Soil Map Unit Name: ErB - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point was taken in an active hayfield that exhibits hydrophytic vegetation. The ag field is drained by DT. A200 and likely contains tiles to remove water. Area was determined to not meet the ACOE wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches):

Water Table Present? Yes _____ No _____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators were met. The area has received below normal precipitation. However, the area is not located in a landscape position likely to collect water. Problematic hydrology of Chapter 5 of the NCNE Regional Supplement was used to analyze.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-225

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Quercus alba	40	Y	FACW
2. Acer rubrum	20	Y	FAC
3. Muhlenbergia schreberi	15	N	FAC
4. Phalaris arundinacea	10	N	FACW
5. Plantago lanceolata	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirement met via the Rapid test.

SOIL

Sampling Point: DP- 225

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR3/1	70	5YR4/6	30	C	M	Silty Clay loam	
16+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 16

Hydric Soil Present? Yes _____ No X

Remarks:

Redox concentrations exhibited sharp boundaries and are consistent in chroma and value with relict hydric soil indicators. Features are not contemporary. Problematic soils of Chapter 5 of the NCNE manual were used to assess the area. Hydrology was also absent due to tiling on drained ag field.

Rock refusal layer may be serving to partially restrict water percolation

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-226

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 3-10

Subregion (LRR or MLRA): LRR R Lat: 42.421650 Long: -79.136511 Datum: NAD 83

Soil Map Unit Name: VaB - Valois gravelly silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the upland community surrounding WL-A2098 (A2108 A211) The sample location is within an active hayfield that has been converted for several years. Normal circumstances are present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches):
Water Table Present?	Yes ____	No ____	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No ____	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation is below average for the year. Climatic/hydrologic conditions are not normal 9d answer, sampling area is within an upland had has little effect on hydrology as it applies to wetland indicators

VEGETATION – Use scientific names of plants.

Sampling Point: DP-226

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Muhlenbergia schreberi	55	Y	FAC
2. Dactylis glomerata	25	Y	FACU
3. Taraxacum officinale	10	N	FACU
4. Trifolium repens	5	N	FACU
5. Plantago lanceolata	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	55	x 3 =	165
FACU species	45	x 4 =	180
UPL species		x 5 =	
Column Totals:	100 (A)		345 (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Sampling area is within an upland. Hydrophytic vegetation requirements not met.

SOIL

Sampling Point: DP-006

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7+	10YR 4/4	100					SL	rock refusal @ 7"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 7"

Hydric Soil Present? Yes ____ No X

Remarks:

No hydric soil indicator met

Multiple pits attempted

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-227

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR R Lat: 42.421723 Long: -79.134614 Datum: NAD 83

Soil Map Unit Name: VaB - Valois gravelly silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A210	

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PEM wetland community of WL-A210. The wetland is an isolated depression within the middle of a hayfield.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The area has received below average snowfall (winter) and precipitation (spring) events within the last several months. Hydrologic conditions are not normal. The area rarely holds water during normal climatic conditions. Three secondary indicators were met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-UPL

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Juncus effusus	20	Y	FACW
2. Scirpus cyperinus	15	Y	OBL
3. Galium boreale	15	Y	FAC
4. Carex vulpinoidea	5	N	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the dominance test.

SOIL

Sampling Point: DP-227

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	90	5YR 4/6	10	C	M/PL	Silt Loam	
6-14	10YR 3/1	65	5YR 4/6	30	C	M/PL	Silty Clay Loam	
			7.5YR 5/8	5	C	M		
14+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 14

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 was met. Redox concentrations exhibited sharp, clear, & diffuse boundaries and were determined to be contemporary features.

Rock refusal was noted at 14" with each attempt. Appears to be serving as a partially restrictive layer.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 228

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): N/A

Subregion (LRR or MLRA): LRR R Lat: 42.412939 Long: -79.134165 Datum: NAD 83

Soil Map Unit Name: ChB - Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes ____ No	If yes, optional Wetland Site ID: WL - A211

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PEM wetland community of A211. The wetland is an isolated depression that extends outside of our search area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation and snowfall (winter) were lower than average over the last several months. Otherwise, inundated systems are uncharacteristically dry. Two secondary hydrologic indicators were met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-20X

Tree Stratum (Plot size: 5'r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 5'r)			
1. Salix bebbiana	5	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5'r)			
1. Typha latifolia	>0	Y	OBL
2. Phalaris arundinacea	10	N	FACW
3. Galium boreale	10	N	FAC
4. Symphyotrichum novi-belgii	20	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110 = Total Cover		

Woody Vine Stratum (Plot size: 5'r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- Y 1 - Rapid Test for Hydrophytic Vegetation
- __ 2 - Dominance Test is >50%
- __ 3 - Prevalence Index is ≤3.0[1]
- __ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- __ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the rapid test. Tree, shrub, & vine stratums were adjusted to account for the wetland boundaries and exclude adjacent upland vegetation.

SOIL

Sampling Point: DP-228

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Silty Clay loam	
2-9	10YR 3/2	98	7.5YR 5/6	5	C	M	Silty Clay loam	
9-14	10YR 3/2	90	7.5YR 5/6	5	C	M	Silty Clay loam	
			7.5YR 6/8	5	C	M		Mixed w/ gravel
14+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 14"

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 was met. Redox concentrations exhibited a majority of diffuse boundaries and were contemporary features. Rock refusal material at 14" with each attempt. Refusal layer appears to be partially restricting water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-229

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR R Lat: 42.398366 Long: -79.137494 Datum: NAD 83

Soil Map Unit Name: LnB - Langford silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No

Hydric Soil Present? Yes ____ No

Wetland Hydrology Present? Yes ____ No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL-A210

Remarks: (Explain alternative procedures here or in a separate report.)

This sampling point represents the PEM wetland community of WL A10. The wetland is a small isolated depression within an agricultural field. Field has been converted for several years. Normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The areas has received below average precipitation and the wetland is drier than normal. Based on landscape position the area will hold water following precipitation (normal) events and surface water (at a minimum) would likely be observed. One primary indicator is assumed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-339

Tree Stratum (Plot size: 10' x 5')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 10' x 5')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 10' x 5')			
1. Juncus effusus	60	Y	FACW
2. Phalaris arundinacea	10	N	FACW
3. Solidago canadensis	10	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 10' x 5')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via Dominance test. Sampling plot was adjusted to account for wetland vegetation and exclude surrounding uplands.

SOIL

Sampling Point: DP-29

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR3/2	75	7.5YR4/4	25	C	M	Silty Clay Loam	Mixed with roots
10-12	2.5Y5/3	40					Silty Clay	
	10YR5/8	60						
12+								Compaction

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 was met. Due to grazing by cows, soil is compacted. Several attempts were made to profile the soil at depth.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-J30

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR R Lat: 42.407072 Long: -79.169240 Datum: NAD 83

Soil Map Unit Name: ChB - Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-AJ13

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PSS wetland community of AJ13. System extends outside of research area and is likely isolated. Opens into a PEM outside of project corridor.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1"

Water Table Present? Yes X No ____ Depth (inches): 9"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Area has received below normal precipitation over last several months. Hydrologic conditions are not typical for time of year.

Four primary and one secondary hydrologic indicators met

VEGETATION – Use scientific names of plants. Sampling Point: DP-336

Tree Stratum (Plot size: 10' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	1	N	FACW
2. Liriodendron tulipifera	1	N	FACU
3.			
4.			
5.			
6.			
7.			
	2 = Total Cover		

Sapling/Shrub Stratum (Plot size: 10' r)			
1. Cornus amomum	30	Y	FACW
2. Alnus incana	5	N	FACW
3. Fraxinus pennsylvanica	2	N	FACW
4.			
5.			
6.			
7.			
	37 = Total Cover		

Herb Stratum (Plot size: 10' r)			
1. Ludwigia peploides	30	Y	OBL
2. Onoclea sensibilis	30	Y	FACW
3. Solidago gigantea	15	N	FACW
4. Viola labradorica	5	N	FAC
5. Eupatorium perfoliatum	3	N	FACW
6. Schoenoplectus tabernaemontani	3	N	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	86 = Total Cover		

Woody Vine Stratum (Plot size: 10' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the rapid test. Vegetative plot was adjusted to only include wetland boundaries within project corridor.

SOIL

Sampling Point: DP-230

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR 3/1	98	10YR 4/6	2	C	M	Silt loam	
11-20	10YR 3/1	80	10YR 5/6	10	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 was met. Redox concentrations were contemporary features generally exhibiting diffuse boundaries.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-231

Investigator(s): Zsiros, Jaime and Nicole Dutcher Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 15-20?

Subregion (LRR or MLRA): LRR R Lat: 42.407330 Long: -79.169167 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland soil pit for wetland WL-A213 about 100' SW, also flag #214.
Upland forest dominated by Acer saccharum, little herbaceous ground cover

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrological indicators met. Not located in landscape position likely to collect water.

VEGETATION – Use scientific names of plants. Sampling Point: DP-231

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	90	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	90 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	10	Y	FACU
2. Prunus pensylvanica	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Acer saccharum	5	N	FACU
2. Parthenocissus quinquefolia	10	Y	FACU
3. Rubus alleghaniensis	5	N	FACU
4. Fraxinus americana	10	Y	FACU
5. Cornus florida	2	N	FACU
6. Ribes cynosbati	5	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	37 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Deciduous hardwood forest, no hydrophytic veg. indicators met.

SOIL

Sampling Point: DP-231

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	100					SiCL	
4-16	10YR 4/4	100					SiCL	
16+								root refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

Root refusal @ 16 inches depth. No hydric soil indicator met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-232

Investigator(s): Zsiros, Jaime and Dutcher, Nicole Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): toe slope Local relief (concave, convex, none): Concave Slope (%): 2 - 5%

Subregion (LRR or MLRA): LRR R Lat: 42.408076 Long: -79.168890 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes ____ No	
Wetland Hydrology Present?	Yes ____ No	If yes, optional Wetland Site ID: WL-A214

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland that is horseshoe shaped and continues beyond the study limits at both ends. Hugs edge of forest and opens up into field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No water table present or saturation, but area has had a dry winter/spring. Wetland located at base of toe slope and edge of forest where geomorphic position would expect water to drain to. Precipitation levels are below average

VEGETATION – Use scientific names of plants.

Sampling Point: DP-232

Tree Stratum (Plot size: 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Sapling/Shrub Stratum (Plot size: 10')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	5	N	FACW
2. Lysimachia nummularia	40	Y	FACW
3. Symphyotrichum puniceum	10	N	OBL
4. Agrostis scabra	40	Y	FAC
5. Vernonia noveboracensis	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 10')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetative plot sizes adjusted due to size of wetland and study area.

SOIL

Sampling Point: DP-232

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	95	7.5Y 4/6	5	C	PL	SiL	
8-16+	10YR 3/1	80	2.5Y 5/4	5	C	M	SiCL	rock refusal
			7.5YR 5/8	15	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 16"

Hydric Soil Present? Yes X No ___

Remarks:

Depleted matrix and redox dark surface indicators met. Rock refusal @ 16" deep, multiple pits attempted. Redox concentrations along pore lining diffuse. Roots in soil to about 10" depth.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-233

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR R Lat: 42.407951 Long: -79.167872 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A215 (PEM)

Remarks: (Explain alternative procedures here or in a separate report.)
This sample point represents a PEM wetland community of A215. The wetland transitions into a PSS and overall is an isolated system. The wetland is located on relatively flat terrain with a slight concavity.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Precipitation in the form of winter snow pack and spring rains is lower than average. All wetland systems within this area are drier than normal. The problematic hydrology section of Chapter 5 of the NCNE manual was utilized. This wetland is located within a landscape position likely to collect water & would likely exhibit strong hydrologic indicators under normal climatic conditions. The area exhibits hydrophytic vegetation & hydric soils & was considered to be a wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-233

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5' r.)			
1. Onoclea sensibulis	40	Y	FACW
2. Symphotrichum puniceum	15	Y	FACW
3. Muhlenbergia schreberi	15	Y	FAC
4. Equisetum arvense	15	Y	FAC
5. Ranunculus acris	5	N	FAC
6. Juncus effusus	3	N	FACW
7. Taraxacum officinale	3	N	FACU
8. Trifolium pratense	3	N	FACU
9.			
10.			
11.			
12.			
	99 = Total Cover		

Woody Vine Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

99% hydrophytic vegetation requirement met via 1.0 dominance test.

SOIL

Sampling Point: DP-233

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					Silty Clay loam	
5-11	10YR 2/1	95	7.5YR 4/6	5	C	M	Silty Clay loam	
11-20	2.5Y 5/2	80	10YR 6/6	20	C	M	Sandy Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 was met Redox concentrations between 5-11" exhibited clear boundaries and concentrations between 11-20" exhibited diffuse boundaries Features were considered contemporary

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-234

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0 - 3

Subregion (LRR or MLRA): LRR R Lat: 42.407611 Long: -79.167717 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A215(PSS)

Remarks: (Explain alternative procedures here or in a separate report.)

This sample point represents the PSS community of WL-A215. The system connects with WL-A215(PEM) and is isolated. Wetland is located within relatively flat terrain with slight concavity

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation is below average (see comments in PEM section). Chapter 5 (Problematic hydrology) was used. The area exhibits a hydric soil and hydrophytic vegetation & is located in a landscape position likely to collect water. A primary indicator is assumed under normal climatic conditions.

VEGETATION – Use scientific names of plants. Sampling Point: DP- 234

Tree Stratum (Plot size: 10' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix discolor	2	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	2 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. Alnus incana	60	Y	FACW
2. Rosa multiflora	10	N	FACU
3.			
4.			
5.			
6.			
7.			
	70 = Total Cover		
Herb Stratum (Plot size: 10' r)			
1. Muhlenbergia schreberi	50	Y	FAC
2. Equisetum arvense	15	N	FAC
3. Symphotrichum puniceum	15	N	OBL
4. Carex amomea	5	N	FACW
5. Fraxinus pennsylvanica	3	N	FACW
6. Agrimonia parviflora	3	N	FAC
7. Alnus incana	3	N	FACW
8.			
9.			
10.			
11.			
12.			
	94 = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the ++ test. Sampling plot was adjusted to account for a representative portion of the wetland.

SOIL

Sampling Point: DP-234

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					Silty Clay Loam	
5-11	10YR 2/1	95	7.5YR 4/6	5	C	M	Silty Clay Loam	
11-20	2.5Y 5/2	80	10YR 6/6	20	C	M	Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 was met

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-235

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): N/A

Subregion (LRR or MLRA): LRR R Lat: 42.407794 Long: -79.167040 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A216 (PSS)

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PSS community of WL-A216. The system transitions into a PEM outside of delineation area, System is isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 3-4"

Water Table Present? Yes X No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 1

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The area has received below average precipitation and water levels are lower than expected. Four primary and two secondary hydrologic indicators met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-235

Tree Stratum (Plot size: 30' x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Sapling/Shrub Stratum (Plot size: 30' x 10')			
1. Cornus amomum	20	Y	FACW
2. Populus tremuloides	10	Y	FACU
3. Alnus incana	3	N	FACW
4. Acer rubrum	3	N	FAC
5. Lonicera tatarica	2	N	FACU
6. Rosa multiflora	2	N	FACU
7.			
	40 = Total Cover		

Herb Stratum (Plot size: 30' x 10')			
1. Onoclea sensibilis	10	Y	FACW
2. Carex crinita	10	Y	OBL
3. Alnus incana	5	N	FACW
4. Cornus amomum	5	N	FACW
5. Galium boreale	2	N	FAC
6. Muhlenbergia schreberia	2	N	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	39 = Total Cover		

Woody Vine Stratum (Plot size: 30' x 10')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

qtydraphytic vegetative requirements met via the rapid test

SOIL

Sampling Point: DP- 235

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y 4/1	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

a hydric soil indicator was not met. However the soil was saturated and any iron would be in solution not exhibiting redoximorphic features until the pit dried. Based on strong hydrology & hydrophytic vegetation hydric soil is assumed

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-236

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5-10%

Subregion (LRR or MLRA): LRR R Lat: 42.407795 Long: -79.166725 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland soil pit for wetlands A215 & A216.

Upland area is an open field with mowed grass about 30' away near cabin.

Field being used as path for ATV's, and evidence of being maintained for access to gas/oil storage tank.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators found. Precipitation levels are below average; however, hydrology would not be expected in this upland sampling area.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 236

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	25	Y	FACU
2. Fraxinus americana	5	N	FACU
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Muhlenbergia schreberi	55	Y	FAC
2. Equistrium arvenses	10	N	FAC
3. Plantago lanceolata	10	N	FACU
4. Potentilla simplex	10	N	FACU
5. Barbarea VULGARIS	5	N	FAC
6. Trifolium repens	5	N	FACU
7. Erigeron philadelphicus	5	N	FAC
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.34% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Not hydrophytic vegetation Vegetation [illegible]
Normal circumstances, field cut every few [illegible]
maintained for gas storage tank to the SE of plot.

SOIL

Sampling Point: DP-236

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	100%					SiCL	mixed w/ rock
12+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 12in.

Hydric Soil Present? Yes ____ No X

Remarks:

Multiple soil pits excavated, soil mixed with rock, Rock refusal @ 12inches, but not acting as a restrictive layer, well drained soils, with dense roots

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-238

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): _____

Subregion (LRR or MLRA): LRR R Lat: 42.410374 Long: -79.165103 Datum: NAD 83

Soil Map Unit Name: CkB-Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A217
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM wetland community of A217. The wetland is located within a hayfield and is isolated. The hayfield has been converted for several years. Normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):	
Water Table Present?	Yes ___ No X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches):	**Wetland Hydrology Present? Yes X No ___**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The area has received below normal precipitation over the last several months, which is contributing to drier wetland systems. Under normal climatic conditions we would expect this system to hold water. Two secondary hydrologic indicators were met. In accordance with Chapter 5 of the NCNE supplement, the area was determined to have a positive primary indicator.

VEGETATION – Use scientific names of plants. Sampling Point: DP-238

Tree Stratum (Plot size: 40'x10')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 40'x10')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 40'x10')			
1. Scirpus cyperinus	70	Y	OBL
2. Phalaris arundinacea	15	N	FACW
3. Alnus incana	3	N	FACW
4. Onoclea sensibilis	3	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	91 = Total Cover		
Woody Vine Stratum (Plot size: 40'x10')			
1.			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the rapid test. Sampling plat was adjusted to account for a representative portion of the wetland to exclude adjacent upland vegetation.

SOIL

Sampling Point: DP-238

Profile Description: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	90	7.5YR 4/4	10	C	M	Silt loam	
7-16	10YR 2/1	90	7.5YR 3/4	7	C	PL	Silty clay loam	
				3	C	M		
16+								Bedrock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If observed):

Type: Rock

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 was met. Redox concentrations exhibited clear boundaries and were considered contemporary features

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-239

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 15-20%

Subregion (LRR or MLRA): LRR R Lat: 42.410099 Long: -79.166206 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland soil pit to wetland WLA2178 2% upland in hardwood forest corridor bounded by fields on west and east. Western NY has had a dry winter/spring season.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators met. Mounded upland area, wetland hydrology not expected.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-239

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	90	Y	FACU
2. Prunus serotina	10	N	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	30	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Rubus allegheniensis	2	N	FACU
2. Podophyllum peltatum	10	Y	FACU
3. Carex pensylvanica	5	N	UPL
4. Erythronium americanum	30	Y	UPL
5. Fraxinus americana	2	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	49	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Mature hardwood forest with little shrub layer, and [illegible] ground cover. About 50% of area is open forest floor. Some dead/fallen trees on ground in forest.

SOIL Sampling Point: DP-239

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 4/1	100?					SL	
9+								root + rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Multiple soil pits attempted for depth. Root and rock refusal @ 9" and down. Surface soil mixed with cobbles and larger. Not a hydric soil, hydric soil not expected on elevated plain / hillslope.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-240

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRR R Lat: 42.410305 Long: -79.166763 Datum: NAD 83

Soil Map Unit Name: BsB - Busti silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ___ Hydric Soil Present? Yes X No ___ Wetland Hydrology Present? Yes X No ___	Is the Sampled Area within a Wetland? Yes X No ___ If yes, optional Wetland Site ID: WL-A018

Remarks: (Explain alternative procedures here or in a separate report.)
Sampling point represents the PSS wetland community of A018. The wetland consists of a vegetated primarily linear swale transition slope in the middle of an active hay field under conversion for several years. Normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches):

Water Table Present? Yes X No ___ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 6

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Precipitation is below normal for the year. Water levels & wetland systems are lower than average.

Two primary and three secondary hydrologic indicators were met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-340

Tree Stratum (Plot size: 30' x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30' x 10')			
1. Salix nigra	60	Y	OBL
2. Salix bebbiana	25	Y	FACW
3. Cornus amomum	15	N	FACW
4.			
5.			
6.			
7.			
	100	= Total Cover	
Herb Stratum (Plot size: 30' x 10')			
1. Onoclea sensibilis	20	Y	FACW
2. Symphyotrichum prenanthoides	20	Y	FAC
3. Symphyotrichum novi-belgii	30	Y	FACW
4. Impatiens capensis	5	N	FACW
5. Cornus amomum	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: 30' x 10')			
1. N/A			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the dominance test. Sampling plot was adjusted to represent the wetland boundary.

SOIL

Sampling Point: DP-340

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of Indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 2/1	98	5YR 3/4	2	C	M	Clay loam	
9-16	2.5Y 5/2	70	10YR 5/4	30	C	M	Clay loam	gravel w/ gravel
16+								Gravel refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicators F3 & F6 were met. Gravel refusal was noted at 16" with each attempt. Gravel is serving as a partially restrictive layer.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 241

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%):

Subregion (LRR or MLRA): LRR R Lat: 42.398408 Long: -79.136280 Datum: NAD 83

Soil Map Unit Name: LnB - Langford silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point provides an upland compliment to NL-AJ736A319. Sampling location is within an agricultural field. Normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels are lower than than normal for this time of year. However, sampling location is within an upland and is not subject to wetland hydrologic indicators.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-341

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	95	Y	FACU
2. Taraxacum officinale	3	N	FACU
3. Cirsium vinosum	3	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	101 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Sampling location is within an upland. Hydrophytic vegetative requirements were not met.

SOIL

Sampling Point: DP-24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/2	100						
8-15	10YR 4/2	95	10YR 5/6	5	C	M		
15+								Compaction

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Mottled redox concentrations were not resulting from hydric conditions and were upland soil inclusions. The soil is located in an upland and a hydric soil indicator was not met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-242

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Ditch Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR R Lat: 42.398427 Long: -79.134816 Datum: NAD 83

Soil Map Unit Name: LnB - Langford silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology Y naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A219

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM wetland community of A219. The system is a roadside ditch that is vegetated with hydrophytic vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels are below normal. Under normal climatic conditions this portion of the ditch would hold water.

Three secondary hydrologic indicators were met

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 243

Tree Stratum (Plot size: 30'x4')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Sapling/Shrub Stratum (Plot size: 30'x4')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Herb Stratum (Plot size: 30'x4')			
1. Typha latifolia	40	Y	OBL
2. Lysimachia nummularia	40	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80	= Total Cover	
Woody Vine Stratum (Plot size: 30'x4')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the rapid test

SOIL

Sampling Point: DP-242

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 5/3	100					Silty Clay Loam	
3+								Rock/Bedrock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock/Bedrock

Depth (inches): 3

Hydric Soil Present? Yes X No ___

Remarks:

Due to a refusal layer noted at 3" throughout the length of the ditch, the soil could not be profiled to depth. Based on the presence of hydrophytic vegetation & hydrology, a hydric soil is assumed

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-244

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat to Concave Slope (%): 3-8

Subregion (LRR or MLRA): LRR R Lat: 42.396627 Long: -79.151443 Datum: NAD 83

Soil Map Unit Name: BsB - Busti silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No

Hydric Soil Present? Yes ____ No

Wetland Hydrology Present? Yes ____ No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL-A220

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM wetland community of WL-A220. The wetland abuts ST-A203 and maintains a connection with the stream.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels for the area are below normal for the year. Under normal climatic conditions we would expect to see elevated water levels. One primary and two secondary hydrologic indicators were met. Drainage channels leading to the adjacent ST-A203 are present. One primary and two secondary hydrologic indicators were met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-244

Tree Stratum (Plot size: 10' x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 10' x 10')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 10' x 10')			
1. Impatiens capensis	50	Y	FACW
2. Symphyotrichum novi-belgii	25	Y	FACW
3. Onoclea sensibilis	10	N	FACW
4. Viburnum opulus	10	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		

Woody Vine Stratum (Plot size: 10' x 10')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirement was met via the rapid test. Sampling plot was adjusted to account for the linear wetland boundaries within the delineation area.

SOIL

Sampling Point: DP-244

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	100					Clay Loam	
5-13	10YR 2/1	95	5YR 4/6	3	C	PL	Clay Loam	
			5YR 4/6	2	C	M	Clay Loam	
13-16	10YR 3/1	100					Sandy Loam	
16+								Bedrock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Bedrock

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Soils meet hydric indicator F6. Bedrock refusal noted at 16" with each attempt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-245

Investigator(s): Jaime Zsiros and Nicole Dunter Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 10%

Subregion (LRR or MLRA): LRR R Lat: 42.396800 Long: -79.151069 Datum: NAD83

Soil Map Unit Name: BgB - Busti silt loam, 0 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland soil pit for wetland WL-A220.

Upland deciduous hardwood forest dominated by Acer saccharum. Area borders mowed field. Area of western NY [illegible]

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Does not meet hydrology indicators. Area not expected to retain water due to location on hill sloping toward open mowed field and stream.

VEGETATION – Use scientific names of plants. Sampling Point: DP-245

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer Saccharum	40	Y	FACU
2. Fagus grandifolia	15	N	FACU
3. Prunus serotina	35	Y	FACU
4. Fraxinus americana	10	N	FACU
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Fraxinus americana	10	Y	FACU
2. Rubus pensylvanicus	35	Y	FACU
3. Fagus grandifolia	5	N	FACU
4.			
5.			
6.			
7.			
	45	= Total Cover	

Herb Stratum (Plot size: 5' R)			
1. Rubus pensylvanicus	20	Y	FACU
2. Dryopteris expansa	40	Y	FAC
3. Maianthemum canadense	10	N	FACU
4. [illegible] repens	10	N	FACU
5. Acer Saccharum	10	N	FACU
6. Fraxinus americana	5	N	FACU
7. Carex gracillima	2	N	FACU
8.			
9.			
10.			
11.			
12.			
	97	= Total Cover	

Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 16.66% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Deciduous hardwood forest with mostly open understory and patches of Rubus ground cover [illegible]

SOIL

Sampling Point: DP-245

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					SCL	
2-16	10YR 3/8	100					S.CL	
16+								Bedrock / Rock ref...

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Not a hydric soil, Bedrock / rock refusal at 16 inches, but does not act as a restrictive layer for groundwater [illegible]

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-246

Investigator(s): Nicole Dutcher, Jaime Zsiros Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 25%

Subregion (LRR or MLRA): LRR Q Lat: 42.391792 Long: -79.148165 Datum: NAD 83

Soil Map Unit Name: CKB-Chautauqua silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point, no wetland features near by. Located on a hillslope, moderate slope, along boundry [illegible] property owners. [illegible] trails

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators found, area [illegible] forest

Precipitation levels are below average for the year

VEGETATION – Use scientific names of plants. Sampling Point: DP-246

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	80	Y	FACU
2. Betula alleghaniensis	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Betula alleghaniensis	20	Y	FAC
2. Rubus pensilvanicus	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Rubus pensilvanicus	25	Y	FACU
2. Acer saccharum	25	Y	FACU
3. Onoclea sensibilis	25	Y	FACW
4. Maianthemum canadense	5	N	FAC
5. Oxalis montana	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Upland forest with mature trees, moderate shrub layer, with about 75% ground cover. Many down trees cut and not upped. No hydrologic vegetation

SOIL

Sampling Point: DP-246

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5YR 2.5/1	100%					CL	
2-9	10YR 4/3	100%					CL	mixed w/ gravel
9-20	10YR 3/2	100%					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicator met. Sampling point is within an upland area

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-247

Investigator(s): Zsiros, Jaime and Nicole Outcher Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 40-50 2

Subregion (LRR or MLRA): LRR R Lat: 42.392562 Long: -79.143137 Datum: NAD 83

Soil Map Unit Name: CkC - Chautauqua silt loam, 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A221

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland in concave section of hillslope. Wetland runs length of hillslope starting at about midway down. Area has recieved below average snow and rainfall so far this year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes X No ____	Depth (inches): 11
Saturation Present? (includes capillary fringe)	Yes X No ____	Depth (inches): 5

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soil is saturated with some parts of wetland having water table at 3", mostly along edge of flagged wetland and outside of study area.

Geomorphic positioning was used due to concave surface of 40-50% hillslope.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 247

Tree Stratum (Plot size: 15' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Rubus idaeus	10	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		

Herb Stratum (Plot size: 5' R)			
1. Carex vulpinoidea	25	Y	OBL
2. Rubus idaeus	15	Y	FACU
3. Onoclea sensibilis	5	N	FACW
4. Solidago rugosa	15	Y	FAC
5. Symphyotrichum puniceum	5	N	OBL
6. Juncus effusus	20	Y	OBL
7. Muhlenbergia Schreberi	15	Y	FAC
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 15' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Adjusted radius of Tree and vine. Stratum to confines [illegible]

SOIL

Sampling Point: DP- 247

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	95	7.5YR 4/4	5	C	M	CL	
5-12	10YR 2/1	100					CL	
12+								Bedrock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Bedrock

Depth (inches): 12"

Hydric Soil Present? Yes X No ___

Remarks:

In first layer of soil concentrations are [illegible]. Hydric soil meets F10 indicator. Bedrock refusal @ 12 inches acting as a restrictive layer for groundwater.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-248

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): none Slope (%): 5%

Subregion (LRR or MLRA): LRR R Lat: 42.393311 Long: -79.141769 Datum: NAD 83

Soil Map Unit Name: Fe-Ilwaquents-Udifluvents complex, frequently flooded NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes ____ No		
Wetland Hydrology Present?	Yes ____ No	If yes, optional Wetland Site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland at toe slope. Wetland fed by groundwater and runoff, from hillslopes due to position along toe slope and valley. Wetland located in old flood plain of stream ST-A204. Area has received below average snow/rainfall for the of year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland fed by groundwater and runoff from hillslopes due to position at toe slope and in valley between two slopes each w/ about 40-50% slope. This area has also received below average snow + rainfall for area, and would expect area due to location and perennial stream to have soil saturation + high water table normally

VEGETATION – Use scientific names of plants.

Sampling Point: DP-248

Tree Stratum (Plot size: 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 10')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 3')			
1. Dennstaedtia punctilobula	10	N	UPL
2. Tussilago farfara	2.0	Y	FACU
3. Onoclea sensibilis	10	N	FACW
4. Phalaris arundinacea	33	Y	FACW
5. Ranunculus acris	2	N	FAC
6. Galium asprellum	5	N	OBL
7. Symphyotrichum puniceum	5	N	OBL
8. Solidago rugosa	10	N	FAC
9. Trillium flexipes	5	N	FAC
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 10')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	43	x 2 =	86
FAC species	17	x 3 =	51
FACU species	20	x 4 =	80
UPL species	10	x 5 =	50
Column Totals:	100 (A)		277 (B)

Prevalence Index = B/A = 2.77

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation plot radii were adjusted due to size of wetland (to stay in confines) and due to edge of study area. Hydrophytic vegetation requirements met using the prevalence index.

SOIL

Sampling Point: DP- 248

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/1	98	7.5YR 3/4	2	C	PL	SiCL	Small sand deposits
7+								Rock Refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 7"

Hydric Soil Present? Yes X No ___

Remarks:

Soil has hydric soil of F6. Rock refusal @ 7" due to area being old stream flood plain bed and being at bottom of toe slope. Small sand / sediment deposits mixed into the soil profile from time periods where are is inundated due to stream flooding.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-250

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 40-50%

Subregion (LRR or MLRA): LRR R Lat: 42.393156 Long: -79.141882 Datum: NAD 83

Soil Map Unit Name: Fo-Ilwaquenty-Unadilla complex, frequently flooded NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point/soil pit for WL-A221, WL-A222 (Mixed deciduous + coniferous forest on hillslope, area bordered by wetland at bottom of slope and open field adjacent. Area of NY has recieved below average snow + rainfall

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators met. Upland located on moderately steep hillslope. No wetland hydrology expected.

VEGETATION – Use scientific names of plants. Sampling Point: DP-250

Tree Stratum (Plot size: 15' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula alleghaniensis	20	Y	FAC
2. Tsuga canadensis	65	Y	FACU
3. Ulmus glutinosa	15	N	FACW
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Betula alleghaniensis	40	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5' R)			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0	= Total Cover	

Woody Vine Stratum (Plot size: 15' R)			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation plot radii have been adjusted to correspond with upland plot is in. Vegetation meets hydrophytic requirements based on a dominance of B. alleghaniensis. This species is almost always found in uplands within this region.

SOIL

Sampling Point: DP-2SO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/3	100?					Si CL	
5-12	10YR 5/4	100?					Si CL	
12+								Root Refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Soils are not hydric, they are well drained on hillslope. Root refusal at 12 inches but does not act as a restrictive layer for ground and surface water.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-052

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 40-50

Subregion (LRR or MLRA): LRR R Lat: 42.392229 Long: -79.143149 Datum: NAD 83

Soil Map Unit Name: CkC - Chautauqua silt loam, 8 to 15% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes ____ No	If yes, optional Wetland Site ID:	WL-A223
Wetland Hydrology Present?	Yes ____ No		

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM wetland of WL-A223. The system is isolated and is located on a steep hillslope. Normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):	
Water Table Present?	Yes ____ No ____	Depth (inches):	5
Saturation Present? (includes capillary fringe)	Yes ____ No ____	Depth (inches):	0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Two primary and two secondary hydrology indicators met. Precipitation was below normal for the region. Saturation was noted from the surface to depth.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-25d

Tree Stratum (Plot size: 3' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 3' r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 3' r)			
1. Equisetum arvense	45	Y	FAC
2. Muhlenbergia schreberi	20	Y	FAC
3. Onoclea sensibilis	10	N	FACW
4. Poa sp.	10	N	FACW
5. Symphyotrichum puniceum	10	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		

Woody Vine Stratum (Plot size: 3' r)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation criteria met via the dominance test. Vegetation was adjusted to a 3' r to account for small herbaceous plants.

SOIL

Sampling Point: DP-[illegible]

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/0	95	7.5YR 4/4	5	C	M	CL	
5-12	10YR 2/1	100					CL	
12+								Bedrock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Bedrock

Depth (inches): 12

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F6 was met. Bedrock refusal encountered at 12" with [illegible] pt. Bedrock is serving a restrictive layer preventing water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-253

Investigator(s): Zsiros, Jaime and Nicole Dutcher Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1-5?

Subregion (LRR or MLRA): LRR R Lat: 42.389483 Long: -79.145153 Datum: NAD 83

Soil Map Unit Name: CkB-Chautauqua silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A224

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland in depression in forest. Western NY has had below average snow/rainfall to date for the season.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Area has experienced below average snow/rainfall for the season. Wetland meets primary indicators of water stained leaves. Wetland is expected to be found in this location because wetland is located in depression of mixed forest meeting geomorphic position.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 253

Tree Stratum (Plot size: 5' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' R)			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 5' R)			
1. Dryopteris Cristata	5	Y	OBL
2. Solidago rugosa	5	Y	FAC
3. Muhlenbergia Schreberi	5	Y	FAC
4. Tussilago farfara	5	Y	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20 = Total Cover		
Woody Vine Stratum (Plot size: 5' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation [illegible] adjacent to [illegible] wetland. Sparse vegetation in PEM wetland in forest. Downed log runs length of wetland w/ moss growing on top.

SOIL

Sampling Point: DP-253

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	2.5Y 3/1	100					CL	
5-13	Gley1 5/10GY	70	10YR 6/6	30	C	M	CL	
13+								clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Clay

Depth (inches): 13

Hydric Soil Present? Yes X No ___

Remarks:

: Hydric Soils are met because their is a gley layer starting at 5inches. The area is also saturated. Clay layer is starting to restrict water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-254

Investigator(s): Zsiros, Jaime and Nicole Ortner Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 10%

Subregion (LRR or MLRA): LRR R Lat: 42.389516 Long: -79.144664 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL-A225

Remarks: (Explain alternative procedures here or in a separate report.)

Isolated PEM wetland in forest, about 75% saturated to surface w/ herbaceous cover, opens up to small open water about 10ft x 6ft x 1/2ft off study site. Area of NY has received below average snow/rain fall

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 0"

Water Table Present? Yes X No ___ Depth (inches): 3"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland saturated to surface of depression area that has drainage pattern leading to area of wetland w/ about 1/2ft deep standing water off study area. Area expected to be wetter during more rain/hydrologic conditions

VEGETATION – Use scientific names of plants.

Sampling Point: DP-254

Tree Stratum (Plot size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Herb Stratum (Plot size: 5')			
1. Solidago rugosa	17	Y	FAC
2. Packera aura	15	Y	FACW
3. Onoclea sensibilis	10	Y	FACW
4. Cornus alba	10	Y	FACW
5. Tussilago farfara	5	Y	FACU
6. Equisetum arvense	3	N	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		

Woody Vine Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- [X] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation plot radii were adjusted to accomidate for size of wetland. Hydrophytic vegetative requirements met via Dominance test.

SOIL

Sampling Point: DP-254

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	95	7.5YR 4/6	5	C	M	SiCL	
5-16	10YR 5/2	70	10YR 4/6	30	C	M	C	
16+								Clay from

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Clay and Rocks

Depth (inches): 16"

Hydric Soil Present? Yes X No ___

Remarks:

Wetk 1 has a hydric soil that displays redox concentrations in the matrix that are FAINT. There is a clay and rock restrictive layer at 16 inches down. Based on strong hydrology and hydrophytic vegetation, the soil was determined to meet F6 although concentrations were faint.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-255

Investigator(s): Zsiros, Jaime and Nicole Dutcher Section, Township, Range: NA

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR or MLRA): LRR R Lat: 42.389835 Long: -79.144875 Datum: NAD 83

Soil Map Unit Name: CkB-Chautauqua silt loam, 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A226

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland nested in forested system, extending beyond survey area to the east. Area of western NY has received below average rainfall to date this year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Area is very wet outside of survey area, water table and saturation of soil likely lower than normal due to below average rainfall for area. Area expected to have hydrology/wetland characteristics due to depression in forested area and [illegible] a geomorphic position as an indicator. Drainage patterns are evident by markings flowing out of study area.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-255

Tree Stratum (Plot size: 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Sapling/Shrub Stratum (Plot size: 10')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	30	Y	FACW
2. Tussilago farfara	5	N	FACU
3. Fraxinus pennsylvanica	5	N	FACW
4. Onoclea [illegible]	5	N	FACW
5. Podophyllum peltatum	[illegible]	N	FACU
6. Glyceria striata	10	N	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	60 = Total Cover		

Woody Vine Stratum (Plot size: 10')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

About 30% of wetland has [illegible] herbac[illegible]
[illegible] is open and no [illegible] cover.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Sampling Point: DP-255

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/1	95	5YR 5/6	5	C	M	SiCL	
7-9	10YR 4/1	100%					SiCL	
9-11	2.5Y 5/1	95	10YR 5/6	5	C	M	SiCL	
11+								Clay and rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock and Clay

Depth (inches): 11

Hydric Soil Present? Yes X No ___

Remarks:

This is a hydric soil because it has redox features in a dark surface that are diffuse. There is a depleted matrix starting @ 7 inches, Depleted Matrix (F3) indicator would also most likely apply but could not get to a full 6 inches due to clay and rock refusal @ 11 inches depth, which [illegible] restrictive layer.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-256

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Ridge Local relief (concave, convex, none): Undulating Slope (%): 3-8

Subregion (LRR or MLRA): LRR R Lat: 42.389666 Long: -79.145693 Datum: NAD 83

Soil Map Unit Name: CkB-Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No
Hydric Soil Present?	Yes _____ No X	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes _____ No X	

Remarks: (Explain alternative procedures here or in a separate report.)

Sampling point represents the upland community surrounding WL-A224, A225, and A226.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____ No _____	Depth (inches):
Water Table Present?	Yes _____ No _____	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____ No _____	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators were met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-05

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	40	Y	FACU
2. Fagus grandifolia	50	Y	FACU
3.			
4.			
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1. Fagus grandifolia	15	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5)			
1. Fagus grandifolia	30		FACU
2. Prunus serotina	20		FACU
3. Dennstaedtia punctilobula	10		UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60	= Total Cover	

Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation criterion met.

SOIL

Sampling Point: DP-256

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	100					S. Si Cl.	
1-7	10YR 5/6	100					Si Cl.	
7+								Dark Weathered Bedrock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicators met. Root restriction noted at 7" with weathered bedrock.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 257

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR R Lat: 42.400247 Long: -79.159565 Datum: NAD 83

Soil Map Unit Name: LnB - Langford silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL - A227

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM wetland community of WL-A227. Wetland was created by human excavation and exhibits undulating terrain. Wetland is isolated and located in an active field. Disturbance is not a new normal circumstance and present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

One primary and two secondary hydrologic indicators. Precipitation levels are below average and wetland systems are drier than expected.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-357

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Eleocharis palustris	50	Y	OBL
2. Carex vulpinoidea	20	N	OBL
3. Muhlenbergia schreberi	15	N	FAC
4. Onoclea sensibilis	10	N	FACW
5. Euthamia graminifolia	[illegible]	N	FAC
6. Ranunculus acris	3	N	FAC
7. Phalaris arundinacea	3	N	FACW
8. Trifolium pratense	3	N	FACU
9. Juncus effusus	5	N	FACW
10.			
11.			
12.			
	112 = Total Cover		

Woody Vine Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ______ (A)

Total Number of Dominant Species Across All Strata: ______ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ______ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation
__ 2 - Dominance Test is >50%
__ 3 - Prevalence Index is ≤3.0[1]
__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation requirement is met via the rapid test. Sampling plot was conducted to gain [illegible] representative component of [illegible] boundaries.

SOIL

Sampling Point: DP- 257

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	2.5Y 4/1	90	10YR 4/6	8	C	M	Silty Clay	Mixed w/gravel
				2	C	PL		
14-16	10YR 5/6	100					Sandy loam	Mixed w/gravel
16+								Bedrock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F3 was met. Bedrock refusal was met at 16" with a matrix. Refusal layer is serving to partially restrict water percolation. Redox concentrations exhibited clear boundaries and were determined to be contemporary features.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/2/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-058

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 20

Subregion (LRR or MLRA): LRR R Lat: 42.400193 Long: -79.157923 Datum: NAD 83

Soil Map Unit Name: LaB - Langford silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A228	

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM wetland community of WL-A228. Wetland appears to have been created by tractor/vehicular ruts and exhibits undulating terrain. Wetland is isolated and located in an open field. Disturbance is not new & normal circumstances are present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels are below average for the year and wetland systems are drier than normal. Under normal climatic conditions we would expect stronger hydrology. The wetland appears seasonally inundated. In accordance with Chapter 5 (problematic hydrology) of the NCNE manual, hydrology is present.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 258

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5' r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5' r)			
1. Juncus effusus	30	Y	FACW
2. Rosa multiflora	30	Y	OBL
3. Phalaris arundinacea	10	N	FACW
4. Muhlenbergia schreberi	10	N	FAC
5. Ranunculus acris	5	N	FAC
6. Equisetum arvense	5	N	FAC
7. Juncus effusus	5	N	FACW
8. Dulichium arundinaceum	3	N	OBL
9.			
10.			
11.			
12.			
	98 = Total Cover		
Woody Vine Stratum (Plot size: 5' r)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirement met via the rapid test. Sampling plot was adjusted to account for a representative component of the wetland boundary.

SOIL

Sampling Point: DP-358

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/1	90	7.5YR 4/6	10	C	M	Silt loam	
6-14	2.5Y 4/1	95	10YR 5/8	5			Clay	
14-20	10YR 5/6	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicators F3 and F6 were met

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-259

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Undulating Slope (%): ____

Subregion (LRR or MLRA): LRR R Lat: 42.400393 Long: -79.157122 Datum: NAD 83

Soil Map Unit Name: LnB – Langford silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____	

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the forested community abutting WL's A227, A228, AA229. The area is a second growth deciduous forest. Normal circumstances are present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches):
Water Table Present?	Yes ____	No ____	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No ____	Depth (inches):

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators were met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-259

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	60	Y	FACU
2. Populus tremuloides	20	Y	FACU
3. Fagus grandifolia	10	N	FACU
4. Tsuga canadensis	10	N	FACU
5.			
6.			
7.			
	100 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Fraxinus americana	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Fraxinus americana	20	Y	FACU
2. Carex gracillima	10	Y	FACU
3. Carex laxiculmis	5	N	UPL
4. Podophyllum pelatum	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Sampling point is within an upland. Hydrophytic vegetative requirements were not met.

SOIL

Sampling Point: DP-259

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/6	100					Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

no hydric soil indicator was met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-260

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Undulating Slope (%): ____

Subregion (LRR or MLRA): LRR R Lat: 42.400749 Long: -79.156372 Datum: NAD 83

Soil Map Unit Name: ErC - Erie silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes ____ No	If yes, optional Wetland Site ID:	WL-A229
Wetland Hydrology Present?	Yes ____ No		

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PFO community of WL-A229. The wetland is isolated and extends outside of our research area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ____	Depth (inches): 1"
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Two primary and three secondary hydrologic indicators met. Precipitation levels are below normal and wetlands systems are drier than expected.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-68

Tree Stratum (Plot size: 10' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	60	Y	FAC
2. Fraxinus pensylvanicum	10	N	FACW
3.			
4.			
5.			
6.			
7.			
	70 = Total Cover		

Sapling/Shrub Stratum (Plot size: 10' r)			
1. Fraxinus pensylvanica	10	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		

Herb Stratum (Plot size: 10' r)			
1. Impatiens capensis	60	Y	FACW
2. Viola labradorica	10	N	FAC
3. Bidens frondosa	5	N	FACW
4. Onoclea sensibilis	3	N	FACW
5. Glyceria striata	3	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	81 = Total Cover		

Woody Vine Stratum (Plot size: 10' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the dominance test. The indicator status of J. canadensis was changed to FAC in accordance with Chapter 5 problematic vegetation of the NCNE manual. This species is frequently found in wetlands.

SOIL

Sampling Point: DP-26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	5Y 2.5/1	100					Silt loam	
2-20	10YR 3/1	100					Silty clay loam.	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator A1 was met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/31/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-262

Investigator(s): Zsiros, Jaime / Dutcher, Nicole Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 5-10%

Subregion (LRR or MLRA): LRR R Lat: 42.378813 Long: -79.139841 Datum: NAD 83

Soil Map Unit Name: ShC - Schuyler silt loam, 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point. Mixed deciduous forest on a moderate slope. Region of NY has received below average rainfall year-to-date.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Region has received below average rainfall to date for the year, no wetland hydrologic field indicators found. No indicators expected for this area due to location (hillslope) and upland

VEGETATION – Use scientific names of plants.

Sampling Point: DP-262

Tree Stratum (Plot size: 30'R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	70	Y	FACU
2. Fagus grandifolia	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15'R)			
1. Fagus grandifolia	20	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5'R)			
1. Fagus grandifolia	20	Y	FACU
2. Podophyllum peltatum	15	Y	FACU
3. Athyrium angustum	10	N	FAC
4. Polystichum acrostichoides	5	N	FACU
5. Acer Saccharum	5	N	FACU
6. Carex pensylvanica	2	N	UPL
7.			
8.			
9.			
10.			
11.			
12.			
	57	= Total Cover	

Woody Vine Stratum (Plot size: 30'R)			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is not hydrophytic, Hydrophytic vegetation not expected to be found in this type.

SOIL

Sampling Point: DP-202

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1	100%					SiCL	
3-20	7.5YR 4/4	100%					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Not a hydric soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/31/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-263

Investigator(s): Zsiros, Jaime / Dutcher, Nicole Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 25?

Subregion (LRR or MLRA): LRR R Lat: 42.407798 Long: -79.149486 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point. Area is all upland, representative sample point in fallow corn field. Region has experienced below average rainfall for the year. Point in open field, with sporatic junk piles and a dirt road along edge.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No field hydrology indicators met. Point on top of hillslope, not expected to have wetland hydrology.

VEGETATION – Use scientific names of plants. Sampling Point: DP-263

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' R)			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 5' R)			
1. Dactylis glomerata	70	Y	FACU
2. Asclepias syriaca	10	N	UPL
3. Solidago rugosa	10	N	FAC
4. Trifolium repens	5	N	FACU
5. Potentilla simplex	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Fallow corn-field that has been left to grow out into an open field.

SOIL

Sampling Point: DP-263

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/3	100					SL	
10+								Compaction/refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Multiple soil pits attempted, could not get below 10" deep. Compaction/refusal @ 10" depth, but does not act as a restrictive layer for water/groundwater. No hydric soil found.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/31

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-265

Investigator(s): Zsiros, Jaime / Dutcher, Nicole Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 10-15?

Subregion (LRR or MLRA): LRR R Lat: 42.431095 Long: -79.115881 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A230

Remarks: (Explain alternative procedures here or in a separate report.)

PEM depressional wetland in upland forest. Region has experienced below average rainfall to date for the year which may affect wetland hydrology. Wetland found in old logging/access road.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Region of NY has received below average rainfall to date for the year. Area normally expected to have Saturation. Water Stained Leaves found throughout wetland. Wetland found in depression of old logging/access road, indicator of geomorphic position.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-26S

Tree Stratum (Plot size: 20'x10')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 20' x 10')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 10' x 10')			
1. Onoclea sensibilis	35	Y	FACW
2. Impatiens Capensis	20	Y	FACW
3. Athyrium angustum	5	N	FAC
4. Carex debilis	30	Y	FACW
5. Glyceria striata	5	N	OBL
6. Rubus Idaeus	5	N	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 20'x10')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

PEM wetland in forest w/ no trees within the wetland. Vegetation plot radius was reduced to fit in the confines of the wetland. All vegetation is OBL, FACW or FAC, and all dominants are FACW.

SOIL

Sampling Point: DP-205

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	95	5YR 4/4	5	C	M	SiCL	
5-9	10YR 3/1	80	5YR 4/4	20	C	M	SiCL	
9-16	2.5Y 6/1	80	10YR 5/8	20	C	M	CL	mixed w/ gravel
16+								Rock + Clay refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If observed):

Type: Rock

Depth (inches): 16

Hydric Soil Present? Yes ____ No X

Remarks:

Multiple soil pits attempted, but could not get below 16 inches on Rock and clay layer @ 16 inches is acting as a refusal layer, and restrictive layer for water Penetration. First two layers meet redox of dark surface (F6) requirements, then it becomes a depleted matrix (F3) starting at 9 inches

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/31/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-266

Investigator(s): Zsiros, Jaime Dutcher, Nicole Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 2-5%

Subregion (LRR or MLRA): LRR R Lat: 42.430851 Long: -79.116586 Datum: NAD 83

Soil Map Unit Name: BsB - Busti silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A231
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

Pem wetland in depression in upland forest, along old access/logging road. Region has experienced below average rainfall to date for the year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0.5"
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Region of NY has received below average rainfall year-to-date. About 50% of wetland has open surface water (A1) an average of 1/2 inch deep. Wetland has water stained leaves throughout entire wetland. Geomorphic position indicator (D2) is met because wetland is located in a depression/concave of old logging/access road.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-106

Tree Stratum (Plot size: 30' x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 30' x 10')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 30' x 10')			
1. Carex flava	10	Y	OBL
2. Juncus pylaei	10	Y	FACW
3. Carex debilis	15	Y	FACW
4. Solidago rugosa	5	N	FAC
5. Persicaria sagittata	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	45 = Total Cover		

Woody Vine Stratum (Plot size: 30' x 10')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

PEM wetland in depression in forest. Vegetation is hydrophytic, and all dominant are FACW and OBL. Vegetation meets the positive rapid test.

SOIL

Sampling Point: DP-2606

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	100					CL	
5-10	5GY 6/1	80	5Y 7/4	20	C	M	CL	
10+								Rock/Gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock and clay

Depth (inches): 10

Hydric Soil Present? Yes X No ___

Remarks:

Soil is hydric and at 5inches in a clay loam with 80% matrix and a gley meeting F2 requirements. At 10inches Rock and clay refusal layer which also acts as a restrictive layer for water penetration.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/31/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-267

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 10?

Subregion (LRR or MLRA): LRR R Lat: 42.430678 Long: -79.116472 Datum: NAD 83

Soil Map Unit Name: BsB - Busti silt loam, 3 to 8% slopes NWI classification: Uplands

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes Y No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data Point for WL-A230 and WL-A231. Data point on a hillslope in upland forest mixed deciduous and coniferous. Region of NY has received below average amount of rainfall year-to-date.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-267

Tree Stratum (Plot size: 30'R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	20	Y	FACU
2. Acer pensylvanicum	10	N	FACU
3. Tsuga canadensis	30	Y	FACU
4. Acer saccharum	40	Y	FACU
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15'R)			
1. Acer pensylvanicum	15	Y	FACU
2. Fagus grandifolia	20	Y	FACU
3. Acer saccharum	5	N	FACU
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5'R)			
1. Trillium erectum	2	N	FAC
2. Acer pensylvanicum	15	Y	FACU
3. Acer saccharum	10	Y	FACU
4. Rubus pensilvanicus	5	N	FACU
5. Athurium angustium	5	N	FAC
6. Maianthemum canadense	16	Y	FACU
7. Fraxinus americana	5	N	FACU
8.			
9.			
10.			
11.			
12.			
	52	= Total Cover	

Woody Vine Stratum (Plot size: 30'R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is not hydrophytic, all dominant vegetation is FACU.

SOIL

Sampling Point: DP-267

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/1	100					SiCL	
1-4	7.5YR 3/4	100					SiCL	
4-20	7.5YR 4/4	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

no hydric soil indicators were met

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-368

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Ridge Local relief (concave, convex, none): none Slope (%): 1-3

Subregion (LRR or MLRA): LRR R Lat: 42.430908 Long: -79.115126 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No	
Wetland Hydrology Present?	Yes ____ No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents a typical trail road through the delineation area. The road is vegetated with scattered opportunistic hydrophytic vegetation. No evidence of hydric soils. Area was determined to not be a wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators were observed. The area has received below normal precipitation over the last several months. Regardless, this area is not in a landscape position likely to collect water, and no evidence of prior hydrology is present.

VEGETATION – Use scientific names of plants. Sampling Point: DP-368

Tree Stratum (Plot size: 30' x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 30' x 10')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30' x 10')			
1. Carex scoparia	30	Y	FACW
2. Brachelytrum erectum	20	Y	FACU
3. Carex deflexa	5	N	FACW
4. Rubus allegheniensis	5	N	FACU
5. Dichanthelium sphaerocarpon	5	N	FACU
6. Polygonum [illegible]	5	N	FAC
7. Potentilla simplex	5	N	FACU
8. Acer saccharum	3	N	FACU
9. Fraxinus americana	3	N	FACU
10. Aquilegia vulgaris	3	N	UPL
11.			
12.			
	84 = Total Cover		
Woody Vine Stratum (Plot size: 30' x 10')			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	35	x 2 =	70
FAC species	5	x 3 =	15
FACU species	24	x 4 =	96
UPL species		x 5 =	
Column Totals:	64 (A)		181 (B)

Prevalence Index = B/A = 2.82

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation are composed of opportunistic species that are frequently found in moist, cool forests in both upland and wetland conditions. The vegetation must meet the prevalence index and the vegetation is marginal

SOIL

Sampling Point: DP-268

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Silty Clay Loam	
6-10	10YR 4/4	100					Silt Loam	
10+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 10

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicator was met. Rock refusal was encountered at 10 inches with attempt. Rock refusal may be serving to partially restrict water percolation after precipitation events

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-269

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR R Lat: 42.451827 Long: -79.108465 Datum: NAD 83

Soil Map Unit Name: CnB - Chenango gravelly loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No

Hydric Soil Present? Yes ____ No

Wetland Hydrology Present? Yes ____ No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL-A232

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the isolated PEM wetland community of WL-A232. The system is a small linear swale along the side of an existing agricultural field. Disturbances are not new. Normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels are below normal and wetland systems are drier than expected for this type of year. There was no landscape position that would hold water and was determined to be seasonally saturated. Chapter 5 (Problematic Hydrology) of the NCNE manual and associated procedure was used to make a positive indication of hydrology.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 269

Tree Stratum (Plot size: 10' x 4')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 10' x 4')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 10' x 4')			
1. Juncus effusus	60	Y	FACW
2. Cyperus esculentus	20	Y	FACW
3. Carex scoparia	5	N	FACW
4. Eupatorium perfoliatum	5	N	FACW
5. Arctium minus	5	N	FACU
6. Trifolium pratense	5	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 10' x 4')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the rapid test.

SOIL

Sampling Point: DP-269

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/3	95	5YR 4/6	5	C	M	Sandy Clay Loam	Mixed w/ gravel
4+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 4

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indication F3 was met. Redox concentrations exhibited clear boundaries and were determined to be contemporary features. Rock refusal noted at 4" with each profile attempt. Refusal layer is serving to partially restrict water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-370

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depressional Swale Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR R Lat: 42.451776 Long: -79.109331 Datum: NAD 83

Soil Map Unit Name: CnC - Chenango gravelly loam, 8 to 15% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A233

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the isolated PEM wetland community of WL-A233. Small depressional swale on the side of an existing ag field. Disturbances are not new and normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No Y	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No Y	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels are below normal and the area is drier than expected. Wetland is a landscape position likely to hold water and exhibits hydrophytic vegetation. Chapter 5 of the NCNE manual c associated problematic hydrology was utilized to make a positive determination of hydrology.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-UPL

Tree Stratum (Plot size: 3' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 3' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 3' r)			
1. Typha latifolia	25	Y	OBL
2. Eupatorium grandifolium	20	Y	FAC
3. Juncus effusus	20	Y	FACW
4. Onoclea sensibilis	5	N	FACW
5. Symphyotrichum novae-angliae	10	N	FACW
6. Acalypha rhomboidea	5	N	FACU
7. Carex flava	10	N	OBL
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 3' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the rapid test. Sampling plot was adjusted to account for wetland boundaries

SOIL

Sampling Point: DP-070

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/2	95	5YR 4/6	5	C	M	SiCL	
4-11	2.5Y 4/1	93	5YR 4/6	2	C	M	SiCL	prominent and continuous throughout layer
			10YR 4/4	5	C	M	SiCL	faint concentrations mixed w/ gravel
11+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F3 was met. Rock refusal noted at 11" with each profile attempt. Refusal layer is serving to partially restrict water.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-271

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Undulating Slope (%): 3-5

Subregion (LRR or MLRA): LRR R Lat: 42.451907 Long: -79.109189 Datum: NAD 83

Soil Map Unit Name: CAC - Chenango gravelly loam, 8 to 15% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present? Yes _____ No	
Wetland Hydrology Present? Yes _____ No	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)
Sample point provides the upland compliment to WL-A330 & WL-A333. Sampling area is located in a second growth deciduous forest

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches):

Water Table Present? Yes _____ No _____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Sampling area is within an upland. No hydrologic indicators were met. Precipitation levels are below normal, but does not have any effects on the upland sampling area.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-271

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	95	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	95 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Rubus allegheniensis	15	Y	FACU
2. Rubus pensilvanicus	15	Y	FACU
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Dactylis glomerata	20	Y	FACU
2. Galium aparine	25	Y	FACU
3. Polygonum virginianum	15	N	FAC
4. Glechoma hederacea	5	N	FACU
5. Solidago rugosa	5	N	FAC
6. Impatiens capensis	5	N	FACW
7. Arctium lappa	3	N	UPL
8. Tussilago farfara	10	N	FACU
9. Prunus pensylvanica	3	N	FACU
10. Carex laxiculmus	3	N	UPL
11.			
12.			
	89 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements were not met

SOIL

Sampling Point: DP-37

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/3	100					Silty clay loam	
6-11	10YR 4/3	100					Silty clay loam	
11+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No hydric soil indicators met. Rock refusal noted at 11". Not serving as a restrictive layer.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-273

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Toe of Slope Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR R Lat: 42.45946 Long: -79.11217 Datum: NAD 83

Soil Map Unit Name: CkC - Chautauqua silt loam, 8 to 15% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A234

Remarks: (Explain alternative procedures here or in a separate report.)
Sample point represents the PEM wetland community of WL-A234. The wetland connects with ST-A205 and may have historically been a channel. The wetland is located within a deciduous forest, but has no trees rooted and is functioning as a PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1"

Water Table Present? Yes X No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Precipitation levels are below normal; however hydrology indicators are strong.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-273

Tree Stratum (Plot size: 3' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 3' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 3' r)			
1. Carex flavicans	30	Y	FACW
2. Onoclea sensibilis	20	Y	FACW
3. Impatiens capensis	15	N	FACW
4. Teesia virginica	10	N	FACW
5. Carex stipata	10	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 3' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes Y No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met, via the rapid test. Sampling plot adjusted to account for wetland boundaries.

SOIL

Sampling Point: DP-273

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100					Silt loam	
10+								Refusal Inagpa.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Inagpa

Depth (inches): 10

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil A1 indicator was met based on the presence of an organic layer over rock/gravel.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-J74

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 15-30

Subregion (LRR or MLRA): LRR R Lat: 42.452231 Long: -79.112375 Datum: NAD 83

Soil Map Unit Name: CkC - Chautauqua silt loam, 8 to 15% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL-A335

Remarks: (Explain alternative procedures here or in a separate report.)

Sampling point represents the PEM wetland community of WL-A335. The system is a small isolated area influenced by groundwater seepage.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels are below normal for the year. The system receives hydrology from a groundwater influence. Soil is moist at around 12 inches. Under normal climatic conditions we would expect to see a water table. area is assumed to be positive for hydrology. Chapter 5 was used to evaluate problematic hydrology.

Sampling Point: DP-274

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5' r)			
1. Juncus effusus	30	Y	FACW
2. Carex vulpinoidea	30	Y	OBL
3. Ranunculus acris	15	N	FAC
4. Eupatorium perfoliatum	10	N	FACW
5. Muhlenbergia schreberi	10	N	FAC
6. Symphyotrichum prenanthoides	5	N	FAC
7.			
8.			
9.			
10.			
11.			
12.	100	= Total Cover	

Woody Vine Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirement met via the rapid test

Sampling plat was adjusted to account for the boundary of the wetland

SOIL

Sampling Point: DP-274

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/1	95	7.5YR 4/6	5	C	PL	Silty clay loam	
5-10	10YR 3/1	60	7.5YR 6/8	20	C	M	Silty clay loam	
			2.5Y 6/3	20	D	M		
10-11	2.5Y 6/3	80	7.5YR 6/6	20	C	M	clay loam	
11+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (inches): 11

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil F6 was met. Rock refusal was noted at 11 inches with each probe attempt. Refusal layer is serving to partially restrict water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-276

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR R Lat: 42.452785 Long: -79.116407 Datum: NAD 83

Soil Map Unit Name: FmA - Freemont silt loam, 0 to 3% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A236 (PEM)

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM component of WL-A236. The wetland is non-isolated and connects with an NWI mapped wetland (PSS1E)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes X	No ____	Depth (inches): 7
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels are below normal; however, hydrologic indicators are strong. System is both precipitation and groundwater driven

VEGETATION – Use scientific names of plants.

Sampling Point: DP-216

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5' r)			
1. Phalaris arundinacea	75	Y	FACW
2. Onoclea sensibilis	15	N	FACW
3. Glyceria striata	15	N	FACW
4. Symphyotrichum puniceum	5	N	OBL
5. Impatiens capensis	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	115 = Total Cover		

Woody Vine Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic requirement met via the rapid test. Vegetative plot was adjusted to the herbaceous sampling area to account for representative component of the wetland

SOIL

Sampling Point: DP-276

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100					Sandy loam	
16+								Bedrock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Bedrock

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Soil was saturated at time of sampling and soil did not have adequate time to drain out

Rock refusal was encountered at 16 inches with each attempt

Refusal layer is serving to restrict water percolation

→ Based on hydrology and vegetation coupled with the aforementioned, a hydric soil is assumed. Soil was not indicative of a histosol.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-277

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Undulating Slope (%):

Subregion (LRR or MLRA): LRR R Lat: 42.452666 Long: -79.116128 Datum: NAD 83

Soil Map Unit Name: FmA - Jaeman silt loam, 0 to 3% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL-A236 PSS

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PSS component of WL-A236. Wetland connects to a mapped NWI (PSSIE)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 7

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Precipitation levels are below normal; however wetland is exhibiting hydrology. Portions also include intermittent pockets of surface water. Hydrology is both groundwater and precipitation driven.

Sampling Point: DP-277

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Salix bebbiana	20	Y	FACW
2. Salix nigra	10	Y	OBL
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	30	Y	FACW
2. N. cotiens cosensis	30	Y	FACW
3. Symphyotrichum puniceum	10	N	OBL
4. Allaria petiolata	3	N	FACU
5. Mallium asperellum	10	N	OBL
6. Myosotis scorpioides	3	N	OBL
7. Solidago rugosa	3	N	FAC
8. Typha latifolia	5	N	OBL
9. Leersia virginica	5	N	FACW
10. Lysimachia nummularia	5	N	FACW
11.			
12.			
	104 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the rapid test.

SOIL

Sampling Point: DP-2 77

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1						Sandy loam	
16+								Bedrock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If observed):

Type: Bedrock

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Soil was saturated at time of sampling and note enough time was available for the soil profile to dry. We would expect for this soil to meet redox dark surface if the iron in solution was allowed to oxidize. A hydric soil indication was assumed based on the aforementioned presence of hydrology and hydrophytic vegetation. Bedrock refusal was noted at 16" with each profile attempt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/1/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-279

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 20

Subregion (LRR or MLRA): LRR R Lat: 42.452804 Long: -79.115903 Datum: NAD 83

Soil Map Unit Name: EmA - Freemont silt loam, 0 to 3% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No Hydric Soil Present? Yes _____ No Wetland Hydrology Present? Yes _____ No	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point provides an upland compliment to wetlands A235 & 236. Area is a forested strip between WL-A236 and an existing agricultural field. Normal circumstances are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches):

Water Table Present? Yes _____ No _____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches):

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling point is within an upland. No hydrologic indicators were met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-J79

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Rhus typhina	60	Y	UPL
2. Acer platanoides	20	Y	UPL
3. Populus tremuloides	10	N	FACU
4.			
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Rhus typhina	15	Y	UPL
2. Rubus idaeus	15	Y	FACU
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Galium aparine	70	Y	FACU
2. Solidago rugosa	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	90	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

1 hydrophytic vegetation requirements were not met.
Sampling location was in an upland

SOIL

Sampling Point: DP- 279

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/4	100					Silt loam	
6+								Rock refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No hydric soil indicators were met. Sampling area is within an upland. Rock refusal encountered at 6" with each profile attempt. Refusal layer is not restricting water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/3/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-289

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): 30

Subregion (LRR or MLRA): LRR R Lat: 42.467585 Long: -79.149046 Datum: NAD 83

Soil Map Unit Name: ToF - Dunkirk silt loam, 35 to 50% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

If yes, optional Wetland Site ID: WL-A337

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM wetland community of WL-A337. The wetland is on top of a ridge that is fed by a groundwater seep. The system seeps into ST-A310 and is non-isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

One primary, one secondary hydrologic indicators met. System is groundwater fed. Soil was saturated to the surface, but was not associated with a water table. System is also influenced by precipitation and surface runoff. Precipitation levels are below normal; however, the system is still saturated.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-287

Tree Stratum (Plot size: 30' x 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 30' x 10')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 30' x 10')			
1. Leersia oryzoides	40	Y	FACW
2. Impatiens capensis	20	Y	FACW
3. Carex cristata	10	N	OBL
4. Viola labradorica	10	N	FAC
5. Galium boreale	5	N	FAC
6. Poa multiflora	5	N	FACU
7. Equisetum sylvaticum	3	N	FACW
8.			
9.			
10.			
11.			
12.			
	93 = Total Cover		

Woody Vine Stratum (Plot size: 30' x 10')			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation requirements met via the rapid test. Sampling plot was adjusted to the boundaries of the wetland

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling Point: DP-389

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 4/2	97	10YR 5/8	3			Silt loam	
2-5	10YR 5/1	50						
	10YR 6/8	50					Clay	Mixed with shale
5+								Shale refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Shale

Depth (inches): 5

Hydric Soil Present? Yes X No ___

Remarks:

Shale refusal noted at 5" with each profile dug pit. Refusal layer is serving to restrict water penetration. Hydric soil indicator F3 was met.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/3/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-390

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 15

Subregion (LRR or MLRA): LRR R Lat: 42.467977 Long: -79.149387 Datum: NAD 83

Soil Map Unit Name: IoF - Lordstown silt loam, 35 to 50% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No	
Wetland Hydrology Present?	Yes ____ No	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point provides an upland compliment to WL-A137 and A338. Sampling area is located within a second growth deciduous forest.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators were observed. Sampling point is within an upland.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-090

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	90	Y	FACU
2. Ostrya virginiana	10	N	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Lindera benzoin	5	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Acer saccharum	5	Y	FACU
2. Parthenocissus quinquefolia	3	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	8	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia	2	Y	FAC
2.			
3.			
4.			
	2	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Majority of herbaceous horizon is covered by leaves and is sparsely vegetated. Hydrophytic vegetation criteria was not met

SOIL

Sampling Point: DP-390

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-30	10YR 4/4	100					Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

No hydric soil indicator met. Sampling location is an upland.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/3/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-291

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR R Lat: 42.469305 Long: -79.148997 Datum: NAD 83

Soil Map Unit Name: FmB-Fremont silt loam, 3 to 8 % slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes Y No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A238(PEM)

Remarks: (Explain alternative procedures here or in a separate report.)

Sampling point represents the PEM component of WL-A238. The wetland is a non-isolated, linear swale on the side of an access road / snow mobile trail. The system transitions into a PSS.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

One primary and two secondary hydrologic indicators were met. Precipitation levels are below normal. Under normal climatic conditions we would expect to observe surface water. System is primarily precipitation-driven.

Sampling Point: DP-291

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 10' x 5')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.		= Total Cover	
Sapling/Shrub Stratum (Plot size: 10' x 5')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.		= Total Cover	
Herb Stratum (Plot size: 10' x 5')			
1. Hydrophyllum microphyllum	25	Y	FACW
2. Onoclea sensibilis	25	Y	FACW
3. Typha latifolia	15	N	FACW
4. Eupatorium perfoliatum	3	N	FACW
5. Impatiens capensis	3	N	OBL
6. Solidago canadensis	5	N	FAC
7. Leersia oryzoides	5	N	FACW
8.			
9.			
10.			
11.			
12.	81	= Total Cover	
Woody Vine Stratum (Plot size: 10' x 5')			
1. N/A			
2.			
3.			
4.		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the rapid test. Sampling plot was adjusted to accommodate for the linear nature of the wetland.

SOIL

Sampling Point: DP-291

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	5Y 4/1	80	7.5YR 4/6	20	C	M	Silty Clay Loam	
8-20	2.5Y 2.5/1	85	5YR 4/6	10	C	M	Silty Clay Loam	CM - sharp boundaries
			2.5Y 5/6	5	C	M		CM - diffuse boundaries

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicators were met. Redox concentrations between 0-8" exhibited clear to diffuse boundaries.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/3/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-292

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Flat to Convex Slope (%): 1

Subregion (LRR or MLRA): LRR R Lat: 42.469187 Long: -79.149030 Datum: NAD 83

Soil Map Unit Name: OrC - Orpark silt loam, 8 to 15% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes ____ No		
Wetland Hydrology Present?	Yes ____ No	If yes, optional Wetland Site ID:	WL-A238 (PSS)

Remarks: (Explain alternative procedures here or in a separate report.)
Sample point represents the PSS component of WL-A238. The wetland is non-isolated and transitions into a PEM.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
One primary and two secondary hydrologic indicators were met. Precipitation levels are below normal. Under normal climatic conditions we would expect to observe surface water. System is primarily precipitation driven.

VEGETATION – Use scientific names of plants. Sampling Point: DP-09/

Tree Stratum (Plot size: 15' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Lonicera tatarica	20	Y	FACU
2. Cornus amomum	10	Y	FACW
3. Alnus incana	10	Y	FACW
4. Rosa multiflora	5	N	FAC
5.			
6.			
7.			
	45 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Carex blanda	25	Y	OBL
2. Onoclea sensibilis	20	N	FACW
3. Agrostis gigantea	20	N	FACW
4. Scirpus cyperinus	5	N	OBL
5. Solidago canadensis	5	N	FAC
6. Cyperus strigosus	5	N	OBL
7. Eleocharis palustris	10	N	OBL
8. Leersia oryzoides	5	N	FACW
9. Carex vulpinoidea	3	N	OBL
10. Carex comosa	3	N	OBL
11.			
12.			
	101 = Total Cover		
Woody Vine Stratum (Plot size: 15' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the dominance test. Lonicera tatarica is commonly found in many wetland systems within this region.

SOIL

Sampling Point: DP-292

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	5Y 4/1	80	7.5YR 4/6	20	C	M	Silty Clay Loam	
8-20	2.5Y 2.5/1	85	5YR 4/6	10	C	M	Silty Clay Loam	cm-sharp boundaries
			2.5Y 5/6	5	C	M		cm - diffuse boundaries

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F3 was met. Redox concentrations between 0-8" exhibited clear to diffuse boundaries.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/3/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-295

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 3-4

Subregion (LRR or MLRA): LRR R Lat: 42.473481 Long: -79.149434 Datum: NAD 83

Soil Map Unit Name: EmA-Tremont silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A239 (PEM)

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point represents the PEM wetland community of A239. The wetland surrounds a shallow gas well installed years ago. The system transitions into a PFO

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Two secondary hydrology indicators were met. Precipitation levels are below average. Under normal climatic conditions we would expect to see surface water. Hydrology is precipitation driven.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-295

Tree Stratum (Plot size: 5' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 5' r)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5' r)			
1. Carex crinita	35	Y	OBL
2. Carex flava	30	Y	OBL
3. Phalaris arundinacea	20	Y	FACW
4. Onoclea sensibilis	10	N	FACW
5. Galium boreale	5	N	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 5' r)			
1. N/A			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements met via the rapid test. Tree sapling and vine stratums were adjusted to a 5' radius to incorporate the wetland boundaries

SOIL

Sampling Point: DP-295

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/1	95	7.5YR 5/8	5	C	M	Silty Clay	
6-16	2.5Y 5/2	45	10YR 6/8	5	C	M	Clay	Dual Matrix Colors
	2.5Y 5/6	50						
16+								Fragipan

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Fragipan

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil F3 was met. Fragipan is a natural layer serving to restrict water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/3/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-296

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): ____

Subregion (LRR or MLRA): LRR R Lat: 42.473428 Long: -79.149113 Datum: NAD 83

Soil Map Unit Name: FmA-Freemont Silt Loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A239 PFO

Remarks: (Explain alternative procedures here or in a separate report.)

Sampling point represents the PFO wetland component of A239. The wetland surrounds a shallow gas well and is isolated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Three secondary hydrologic indicators were met. Precipitation levels are below average. Under normal climatic conditions we would expect to observe, at a minimum, surface water. Hydrology is precipitation driven.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-296

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	60	Y	FACW
2. Crataegus crus-galli	30	Y	FAC
3. Populus tremuloides	15	N	FACU
4.			
5.			
6.			
7.			
	105	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus racemosa	20	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Phragmites australis	40	Y	FACW
2. Onoclea sensibilis	40	Y	FACW
3. Toxicodendron radicans	15	N	FAC
4. Viburnum prunifolium	5	N	FAC
5. Agrimonia parviflora	10	N	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

9d hydrophytic vegetative requirements met via the dominance test.

SOIL

Sampling Point: DP-296

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/1	95	7.5YR 5/8	5	C	M	Silty Clay	
6-16	2.5Y 5/2	45	10YR 6/8	5	C	M	Clay	Dual Matrix Colors
	2.5Y 5/6	50						
16+								Inceptisol

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Inceptisol

Depth (inches): 16

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil indicator F3 was met. Inceptisol refusal layer serving to restrict water percolation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/3/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-297

Investigator(s): Zsiros, Jaime Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Undulating Slope (%): 15

Subregion (LRR or MLRA): LRR R Lat: 42.472590 Long: -79.149615 Datum: NAD 83

Soil Map Unit Name: FmA - Fremont silt loam, 3 to 8% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No

Hydric Soil Present? Yes ____ No

Wetland Hydrology Present? Yes ____ No

Is the Sampled Area within a Wetland? Yes ____ No X

If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Sample point serves as the upland compliment to wetland DP-297. Sampling area is within a second growth deciduous forest.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators were observed. Precipitation levels are below normal, but has no effect on upland areas.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-297

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	60	Y	FACU
2. Prunus pensylvanica	20	Y	FACU
3. Prunus serotina	15	N	FACU
4.			
5.			
6.			
7.			
	95	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Lonicera tatarica	5	Y	FACU
2. Lindera benzoin	5	Y	FACW
3. Rosa multiflora	5	Y	FACU
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Lindera benzoin	30	Y	FACW
2. Toxicodendron radicans	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetative requirements were not met. Lindera benzoin and Toxicodendron radicans are frequently found in both upland and wetland conditions.

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling Point: DP-297

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 4/2	100					Silt loam	
7+								Root refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

a hydric soil indicator was not met. Root refusal was noted at 7" with each profile attempt.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/26/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-500

Investigator(s): M. BOBERG B. VITS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.134382 Long: 42.40325 Datum: NAD 83

Soil Map Unit Name: Fluvaquents-udifluvents complex NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present? Yes X No	
Wetland Hydrology Present? Yes X No	If yes, optional Wetland Site ID: WL-A500

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0"-4"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

- iron reduction film on standing water

VEGETATION – Use scientific names of plants.

Sampling Point: DP-SOO

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Ranunculus bulbosus	39	Y	FACW
2. Bidens aristosa	30	Y	FACW
3. Mentha spicata	5	N	FACW
4. Juncus effusus	5	N	OBL
5. Polygonum persicaria	1	N	NI
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

FAC Neutral Test

2 FACW + 0 OBL = 2 wetland

0 FACU + 0 UPL = 0 upland

SOIL

Sampling Point: DP-500

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7"	2.5Y 3/1	95	10YR 3/6	5	C	M/PL	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- MB X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/20/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 501

Investigator(s): M. Babcock B. Vitz Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.134308 Long: 42.403325 Datum: NAD 83

Soil Map Unit Name: Fluvaquents - udifluvents complex NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes _____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-501

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceus	65	Y	FACU
2. Rumex crispus	10	N	FAC
3. Mentha spicata	5	N	FACW
4. Solidago canadensis	5	N	FACU
5. Euthamia graminifolia	5	N	FAC
6. Ranunculus bulbosus	5	N	FACW
7. Trifolium repens	5	N	FACU
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	15	x 3 =	45
FACU species	75	x 4 =	300
UPL species	0	x 5 =	0
Column Totals:	100 (A)		365 (B)

Prevalence Index = B/A = 3.65

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

FAC Neutral Test

0 FACW + 0 OBL = 0 wetland

1 FACU + 0 UPL = 1 upland ✓

SOIL

Sampling Point: DP-501

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	2.5y 3/3	100					SL	
6-12"	2.5y 3/3	80	10YR 5/1	20	D	M	CL	Gravelly
12-18	2.5y 3/3	60	10YR 5/1	40	D	M	CL	Gravelly

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ____ No X

Remarks:

- Augar refusal at 18".

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/21/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 503

Investigator(s): M. BOBERG B. VIRTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.13468 Long: 42.403504 Datum: NAD 83

Soil Map Unit Name: Fluvaquents-udifluvents complex NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No	**Is the Sampled Area within a Wetland?** Yes X No If yes, optional Wetland Site ID: WL-A501

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0"-2"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-503

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. ~~Salix Epilobium ciliatum~~	~~40~~	~~Y~~	~~OBL~~
2. Salix petiolaris	40	Y	FACW
3.			
4.			
5.			
6.			
7.			
	40 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Carex flava	40	Y	OBL
2. Scirpus cyperinas	30	Y	OBL
3. Juncus effusus	15	N	OBL
4. mentha spicata	5	N	FACW
5. Carex lupulina	5	N	OBL
6. Carex hystricina	4	N	OBL
7. Symphytrichum provac-angline	1	N	FACW
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-503

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5"	2.5Y 4/2	83	2.5Y 4/15	15	D	M	SL	
			7.5YR 3/4	2	C	M	SL	
5-10"	2.5Y 4/1	75	2.5Y 4/2	20	C	M	S	
			10YR 5/8	5	C	PL	S	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/26/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-505

Investigator(s): M Boberg B Viits Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.1337855 Long: ~~Villenova~~ mB 42.404931 Datum: NAD 83

Soil Map Unit Name: Chadakoin Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No	**Is the Sampled Area within a Wetland?** Yes X No If yes, optional Wetland Site ID: WL-A502

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-5"

Water Table Present? Yes X No ____ Depth (inches): 0-5"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0-5"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-505

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Carex flava	50	Y	OBL
2. Juncus effusus	20	Y	OBL
3. Scirpus cyperinas	10	N	OBL
4. Mentha spicata	10	N	FACW
5. Bidens aristosa	5	N	FACW
6. Eupatorium perfoliatum	4	N	FACW
7. Symphyotrichum novae-angliae	1	N	FACW
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	80	x 1 =	80
FACW species	20	x 2 =	40
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		120 (B)

Prevalence Index = B/A = 1.2

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

FAC Neutral Test

0 FACW + 2 OBL = 2 Wetland ✓

0 FACU + 0 UPL = 0 upland

SOIL

Sampling Point: DP-505

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	10YR 3/1	95	2.5y 3/2	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/26/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-506

Investigator(s): M Boberg B Viti Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.13386 Long: 42.404915 Datum: NAD 83

Soil Map Unit Name: Chadakoin silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ~~X~~ MB	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-5060

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceous	64	Y	FACU
2. Trifolium repens	15	N	FACU
3. Euthamia graminifolia	10	N	FAC
4. Ranunculus bulbosus	5	N	FACW
5. Mentha spicata	3	N	FACW
6. Taraxacum officinale	1	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ~~100~~ 0 BV (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	11	x 3 =	33
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	101 (A)		373 (B)

Prevalence Index = B/A = 3.69

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X BV 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

FAC Neutral Test

0 FACW + 0 OBL = 0 wetland

1 FACU + 0 UPL = 1 upland

SOIL

Sampling Point: DP-506

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	2.5Y 3/2	98	10YR 5/6	2	C	M	SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ~~X~~ NB

Remarks:

- Augar refusal at 16".

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/26/2015 ~~DP-507-mb~~

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-307

Investigator(s): M Boberg B. Wilts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.131553 Long: 42.405829 Datum: NAD83

Soil Map Unit Name: Erie Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A503

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

- surface water in tractor ruts

VEGETATION – Use scientific names of plants.

Sampling Point: DP-507

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Carex flava	20	Y	OBL
2. Polygonum artifolum	20	Y	OBL
3. Ranunculus bulbosus	15	Y	FACW
4. Rumex crispus	15	N	FAC
5. Solidago canadensis	10	N	FACU
6. Eutrhamia graminifolia	10	N	FAC
7. Symphyotichum novae-angliae	5	N	FACW
8. Juncus effusus	5	N	OBL
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

FAC Neutral Test

1 FACW + 2 OBL = 3 wetland ✓

0 FACU + 0 UPL = 0 upland

SOIL

Sampling Point: DB-507

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	10YR 3/2	95	7.5YR 4/6	5	C	M	SL	
6-12"	10YR 4/2	90	7.5YR 4/6	10	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/26/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-508

Investigator(s): M. Boberg B. Viitz Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.131505 Long: 42.405828 Datum: NAD 83

Soil Map Unit Name: Erie Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (Includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-508

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Trifolium repens	40	Y	FACU
2. Schedonorus arundinaceous	35	Y	FACU
3. Daucus L.	10	N	NI
4. Euthamia graminifolia	5	N	FAC
5. Rumex crispus	5	N	FAC
6. Pantago lanceolata	5	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	90 (A)		350 (B)

Prevalence Index = B/A = 3.88

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

FAC Neutral Test

0 FACW + 0 OBL = 0 wetland

2 FACU + 0 UPL = 2 upland

SOIL

Sampling Point: DP-508

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12"	10YR 3/3	100					SL	
12-20"	2.5Y 3/2	95	10YR 5/8	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10-27-2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-509

Investigator(s): M. Boberg B. Viets Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Drainageway/impoundment Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.121189 Long: 42.406241 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A504
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-4"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-509

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus racemosa	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Scirpus cyperinus	50	Y	OBL
2. Typha angustifolia	25	Y	OBL
3. Juncus effusus	15	N	OBL
4. Mentha spicata	5	N	FACW
5. Epilobium ciliatum	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

FAC NEUTRAL TEST

2 FACW + 2 OBL = 2 wetland ✓

0 FACU + 0 UPL = 0 upland.

SOIL

Sampling Point: DP-509

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	2.5Y 3/2	98	10YR 4/6	2	C	M	SL	
3-6"	2.5Y 4/1	95	2.5Y 5/6	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10-27-2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 510

Investigator(s): M Boberg B Viitz Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.121347 Long: 42.406253 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes X No	

Remarks: (Explain alternative procedures here or in a separate report.)

upland data point

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No X Depth (inches): 10"

Saturation Present? (includes capillary fringe) Yes X No X Depth (inches): 10"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-510

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus racemosa	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	80	Y	FACU
2. Euthamia graminifolia	10	N	FAC
3. Carex flava	5	N	OBL
4. Symphyotichum novae-angliae	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	20	x 3 =	60
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	110 (A)		395 (B)

Prevalence Index = B/A = 3.59

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

FAC NEUTRAL TEST

0 FACW + 0 OBL = 0 wetland

1 FACU + 0 UPL = 1 upland

SOIL

Sampling Point: DP-310

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3"	2.5Y 3/1	98	7.5YR 3/2	5	C	M	SL	
3-6"	2.5Y 3/1	85	2.5Y 4/2	10	C	M/PL	SL	
~~to 20"~~			7.5YR 3/2	5	C	M/PL	SL	
6-20"	2.5Y 6/3	90	2.5Y 5/6	10	C	M/PL	SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/27/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-511

Investigator(s): B. Viets, M. Bobseine Section, Township, Range: Villanova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.119617 Long: 42.405393 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation Yes, Soil Yes, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A505
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- X Presence of Reduced Iron (C4) BV
- X Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0"-6"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-511

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15)			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5)			
1. Eleocharis obtusa	30	Y	OBL
2. Potamogeton epihydrus	20	Y	OBL
3. Zea mays	5	N	NI
4. Trifolium repens	5	N	FACU
5. Polygonum persicaria	5	N	NI
6. Juncus tenuis	5	N	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		

Woody Vine Stratum (Plot size: 30)			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

0 FACW + 2 OBL = 2 wetland

0 FACU + 0 UPL = 0 upland

SOIL

Sampling Point: DP-SU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	2.5Y 4/2	95	2.5Y 5/6	5	C	M	SiL	
6-12"	2.5y 4/1	90	2.5y 5/4	5	C	M	SL	
			7.5yr 4/6	5	C	PL/M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Soils are Significantly Disturbed. Wetland is located in an active corn field and is plowed/Rutted frequently

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/27/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-512

Investigator(s): M.Boberg B.Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.120003 Long: 42.405635 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No	**Is the Sampled Area within a Wetland?** Yes X No If yes, optional Wetland Site ID: WL-506

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes Y No ____ Depth (inches): 0-3"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-512

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Symphyotrichum novae-angliae	70	Y	FACW
2. Eupatorium perfoliatum	5	N	FACW
3. Euthamia graminifolia	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-512

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	2.5Y 3/2	80	2.5Y 5/1	10	D	M	CL	
			2.5Y 5/6	5	C	PL	CL	
			10YR 5/6	5	C	PL	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10-27-15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-514

Investigator(s): M. Boberg B. Wilts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR or MLRA): LRR-R Lat: 79.111736 Long: 42.407242 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No (yes), Soil No (yes), or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A508
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

A portion of this wetland is located in a plowed field where soils and vegetation are significantly disturbed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No ___	Depth (inches): 6"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): ~~10~~ 4"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-514

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Rhamnus cathartica	5	Y	FACU
2. Rosa multiflora	5	Y	FACU
3. Rubus allegheniensis	5	Y	FACU
4.			
5.			
6.			
7.			
	15 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Euthamia graminifolia	60	Y	FAC
2. polygonum artifolium	20	N	OBL
3. solidago canadensis	10	N	FACU
4. Rubus allegheniensis	10	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	35	x 4 =	~~580~~ 140
UPL species	0	x 5 =	0
Column Totals:	~~175~~ 115 (A)		~~580~~ 340 (B)

Prevalence Index = B/A = 2.95

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

FAC NEUTRAL TEST

0 FACW + 0 OBL = 0 wetland

4 FACU + 0 UPL = 4 upland

SOIL

Sampling Point: DP-514

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	10YR 3/1						SL	
6-18"	10YR 3/1	95	10YR 4/6	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10-27-2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-515

Investigator(s): M. BOBERG B. VIRTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.111778 Long: 42.407228 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

upland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-515

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Rubus allegheniensis	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	60	Y	FACU
2. Rubus allegheniensis	15	N	FACU
3. Daucus pusillus	10	N	N.I
4. Taraxacum officinale	5	N	FACU
5. Daucus carota	5	N	UPL
6. Fragaria vesca	5	N	N.I
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	85	x 4 =	340
UPL species	5	x 5 =	25
Column Totals:	90 (A)		365 (B)

Prevalence Index = B/A = 4.05

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-375

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10"	10YR 3/2	100						
10-18"	10YR 3/2	95	10YR 5/8	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

- Augar refused at 18".

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/28/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-521

Investigator(s): M. Cobera G. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.110665 Long: 42.396908 Datum: NAD 83

Soil Map Unit Name: Schuyler Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A511

Remarks: (Explain alternative procedures here or in a separate report.)

This is a linear stormwater structure that has wetland characteristics adjacent to Ball Hill Road.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-12"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-S21

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Epilobium coloratum	10	Y	OBL
2. Salix petiolaris	10	Y	FACW
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Typha angustifolia	40	Y	OBL
2. Symphyotrichum pilosum	5	N	FAC
3. Euthamia graminifolia	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-521

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	2.5Y 4/2	90	10YR 5/6	10	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ~~X~~ BY Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/28/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-523

Investigator(s): M. BOBERG B. VIRTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): <0

Subregion (LRR or MLRA): LRR-R Lat: 79.140581 Long: 42.395722 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No	**Is the Sampled Area within a Wetland?** Yes X No If yes, optional Wetland Site ID: WL-A512

Remarks: (Explain alternative procedures here or in a separate report.)

- old filled in pond feature.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0 - 3"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-523

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	40	Y	OBL
2. Scirpus cyperinas	20	Y	OBL
3. Euthamia graminifolia	10	N	FAC
4. Ranunculus bulbosus	5	N	FACU
5. Polygonum persicaria	5	N	NI
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-S23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	2.5Y 3/1	95%	2.5Y 4/6	5	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/29/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 524

Investigator(s): B. Vierts, M. Bobeck Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2%

Subregion (LRR or MLRA): LRR-R Lat: 79.140616 Long: 42.395956 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 13"

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-S24

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceus	45	Y	FACU
2. Solidago canadensis	15	Y	FACU
3. Trifolium repens	10	N	FACU
4. Daucus pusillus	10	N	NL
5. Cirsium vulgare	10	N	FACU
6. Plantago lanceolata	5	N	FAC
7. Taraxacum officinale	5	N	FACU
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	90 (A)		355 (B)

Prevalence Index = B/A = 3.94

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-524

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-20"	2.5Y3/3	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/29/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- SZB

Investigator(s): B.Y.eis, M. Boberg Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): H.Isloope Local relief (concave, convex, none): Convex Slope (%): 8

Subregion (LRR or MLRA): LRR-R Lat: 79, 141814 Long: 42, 392699 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A515

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes X No ____ Depth (inches): 10"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-528

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15)			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	50	Y	OBL
2. Carex flava	15	N	OBL
3. Euthamia graminifolia	10	N	FAC
4. Scirpus cyperinus	10	N	OBL
5. Mentha spicata	5	N	FACW
6. Eupatorium perfoliatum	5	N	FACW
7. Ranunculus bulbosus	5	N	FACW
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 528

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10"	2.5Y 4/1	90	2.5Y 5/1	5	D	M	SCL	
			7.5YR 4/6	5	C	PL/M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10-28-15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-529

Investigator(s): M. Boberg B. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 8%

Subregion (LRR or MLRA): LRR-R Lat: 79.141439 Long: 42.392899 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X Hydric Soil Present? Yes ____ No X Wetland Hydrology Present? Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-829

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 6')			
1. Solidago canadensis	55	Y	FACU
2. Euthamia graminifolia	30	Y	FAC
3. Rubus allegheniensis	5	N	FACU
4. Juncus effusus	5	N	OBL
5. Clinopodium vulgare	5	N	NI
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	95 (A)		335 (B)

Prevalence Index = B/A = 3.52

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-529

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14"	10YR 4/4	100					SL	
14-20"	2.5Y 4/3	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/30/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-533

Investigator(s): B. Viers, M. Boberg Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.108607 Long: 42.395769 Datum: NAD 83

Soil Map Unit Name: Dalton Silt Loam NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A517
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0"-4"
Water Table Present?	Yes X	No ____	Depth (inches): 12"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-533

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix nigra	70	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	70 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Salix nigra	20	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Euthamia graminifolia	45	Y	FACW
2. Eupatorium perfoliatum	10	N	FACW
3. Epilobium ciliatum	5	N	FACW
4. impatiens capensis	5	N	FACW
5. Solidago patula	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	95	x 1 =	95
FACW species	20	x 2 =	40
FAC species	0	x 3 =	0
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	155 (A)		315 (B)

Prevalence Index = B/A = 2.03

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 533

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10yr 3/2	95	2.5y 4/6	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/30/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-534

Investigator(s): B. Yurts, M. Bobay Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 3%

Subregion (LRR or MLRA): LRR-R Lat: 79.108576 Long: 42.395813 Datum: NAD 83

Soil Map Unit Name: Dalton silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 534

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Rubus idaeus	85	Y	FACU
2. 5	~~10~~ mg		
3.	5		
4.			
5.			
6.			
7.			
	85 ~~100~~ = Total Cover		

Herb Stratum (Plot size: 5')			
1. Rubus idaeus	10	Y	FACU
2. Schedonorus arundinaceus	10	Y	FACU
3. Solidago canadensis	5	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Vitis rotundifolia	10	Y	NI
2.			
3.			
4.			
	10 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	35 (A)		140 (B)

Prevalence Index = B/A = ~~40~~ 4

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-534

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-10"	2.5Y 3/3	95	2.5YR 4/6	5	C	M		Auger Refusal @ 10"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/30/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-535

Investigator(s): M. BOBERG B. VIETS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): DRAINAWAY Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.104758 Long: 42.396929 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A518

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-5"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 535

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Glyceria acutiflora	50	Y	OBL
2. Juncus effusus	15	N	OBL
3. Iris pseudocorus	10	N	OBL
4. Carex intumescens	10	N	FACW
5. Scirpus cyperinas	5	N	OBL
6. Euthamia graminifolia	5	N	FAC
7. Carex flava	5	N	OBL
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP535

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	2.5Y 4/1	95	2.5Y 3/6	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- MS Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 10/30/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 536

Investigator(s): B. Viets, M. Boberg Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2%

Subregion (LRR or MLRA): LRR-R Lat: 79.104611 Long: 42.396999 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 536

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceous	32	Y	FACU
2. Euthamia graminifolia	30	Y	FAC
3. Solidago canadensis	20	Y	FACU
4. Daucus carota	5	N	UPL
5. Phleum pratense	3	N	FACU
6. Fragaria vesca	2	N	NI
7. Plantago lanceolata	2	N	FAC
8. Taraxacum officinale	2	N	FACU
9. Chenopodium vulgare	2	N	NI
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	32	x 3 =	96
FACU species	59	x 4 =	236
UPL species	5	x 5 =	25
Column Totals:	96 (A)		357 (B)

Prevalence Index = B/A = 3.71

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 536

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-12"	10yR3/3	95	10yR5/6	5	C	m	SIL	
12":20"	10yR4/2	90	10yR7/3	5	C	m	SIL	
			10yR5/6	5	C	m		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/2/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 537

Investigator(s): B. Viets, M. Bobeg Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.101484 Long: 42.395885 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A519
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ~~X~~ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 6"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-537

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Agrostis stolonifera	60	Y	FACW
2. Juncus effusus	15	N	OBL
3. Eutrhamia graminifolia	10	N	FAC
4. Carex flava	5	N	OBL
5. Lycopus americanus	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-537

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-14"	2.5y 3/2	90	2.5y 5/3	5	C	m	SIL	
			10yr 5/8	5	C	m		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/2/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-538

Investigator(s): B. Viets, M. Bobery Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): H. Slope Local relief (concave, convex, none): Convex Slope (%): 2%

Subregion (LRR or MLRA): LRR-R Lat: 79.101267 Long: 42.39602 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X		
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-538

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Agrostis stolonifera	70	Y	FACW
2. Juncus effusus	5	N	OBL
3. Carex flava	5	N	OBL
4. Eutrochium fistulosum (Eutrochium purpureum)	5	N	FAC
5. Trifolium repens	5	N	FACU
6. Plantago lanceolata	5	N	FACU
7. Solidago canadensis	5	N	FACU
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	X = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 538

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-12"	2.5y4/4	98	10yr6/8	2	C	M	SIL	
12"-20"	2.5y6/2	90	10yr6/8	5	C	M	SIL	
			2.5y5/2	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-545

Investigator(s): M BOBERG, S. BUCKENMEYER Section, Township, Range: VILLENOVA

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 2

Subregion (LRR or MLRA): LRR-R Lat: 79.144888 Long: 42.387294 Datum: NAD 83

Soil Map Unit Name: Busti silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A524

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-SAS

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eutamia graminifolia	45	Y	FAC
2. Onoclea sensibilis	30	Y	FACW
3. Agrostis stolonifera	5	N	FACW
4. Scirpus cyperinas	5	N	OBL
5. Carex flava	5	N	OBL
6. Juncus effusus	5	N	OBL
7. Epilobium ciliatum	5	N	FACW
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-SA5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 3/1	95	10YR 5/8	5	C	M	SiL	
2-8	2.5Y 3/1	85	10YR 5/8	5	C	M	SiL	
			2.5Y 4/1	5	C	M	SiL	
			2.5YR 3/4	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 546

Investigator(s): M. Boberg, S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRR-R Lat: 79.145093 Long: 42.387325 Datum: NAD 83

Soil Map Unit Name: Busti silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ~~X~~	No ~~X~~ BV	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 5A6

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	50	Y	FACU
2. Acer saccharum	20	Y	FACU
3. Fagus grandifolia	10	N	FACU
4. Carpinus carolinia	10	N	FAC
5. Prunus serotina	5	N	FACU
6.			
7.			
	95	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	10	Y	FACU
2. Acer saccharum	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5')			
1. ~~NA~~ Thelypteris noveboracensus	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	115 (A)		445 (B)

Prevalence Index = B/A = 3.86

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 546

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/3	100					SIL	
3-20	10YR 4/2	90	10YR 5/4	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-548

Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Oxbow/floodplain Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.145543 Long: 42.388479 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A525

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0"-1"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-548

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	20	Y	FACW
2. Fagus grandifolia	5	N	FACU
3. Tsuga canadensis	5	N	FACU
4.			
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Ranunculus bulbosus	10	Y	FACW
2. Carex flava	5	Y	OBL
3. Lycopus americanus	5	N	OBL
4. Onoclea sensibilis	5	N	FACW
5. Juncus effusus	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 548

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 2.5/1	95	10YR 5/8	5	C	M	SL	gravelly

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

auger refusal at 6 inches.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-549

Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 79.145482 Long: 42.390279 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X (MMS) No (MS)	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A826

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-2"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-S49

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	40	Y	FACU
2. Acer saccharum	20	Y	FACU
3. Betula alleghaniensis	10	N	FAC
4. Fraxinus americana	10	N	FACU
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	5	Y	FACU
2. Acer saccharum	5	Y	FACU
3. Fraxinus americana	5	Y	FACU
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	10	Y	FACW
2. Thelypteris noveboracensas	5	Y	FAC
3. Carex flava	5	Y	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 37.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	10	x 2 =	20
FAC species	15	x 3 =	45
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	115 (A)		410 (B)

Prevalence Index = B/A = 3.56

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No X MB

Remarks: (Include photo numbers here or on a separate sheet.)

Trees + Saplings have adapted to living in a wetland through morphological adaptations like fluted trunks + shallow roots
- Eastern Hemlock - Sugar maple, - White Ash

SOIL

Sampling Point: DP-549

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 2.5/1	95	2.5YR 3/4	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11-3-15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-550

Investigator(s): M. Boberg, S. Bucklenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 79.145244 Long: 42.390496 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A527

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-550

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	60	Y	FACU
2. Betula alleghaniensis	15	N	FAC
3. Acer rubrum	5	N	FAC
4.			
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Betula alleghaniensis	20	Y	FAC
2. Tsuga canadensis	10	Y	FACU
3. Acer rubrum	10	Y	FAC
4. Fraxinus americana	10	Y	FACU
5.			
6.			
7.			
	50	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Thelypteris noveboracensis	5	Y	FAC
2. Onoclea sensibilis	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	95	x 3 =	185
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	180 (A)		495 (B)

Prevalence Index = B/A = 3.53

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ~~3~~ MB

Remarks: (Include photo numbers here or on a separate sheet.)

TREES + SAPLINGS HAVE ADAPTED TO LIVING IN A WETLAND BY DEVELOPING MORPHOLOGICAL ADAPTATIONS LIKE FLUTED TRUNKS

- Eastern Hemlock
- White Ash

SOIL

Sampling Point: DP-SSO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 2.5/1	90	2.5Y 3/2	5	C	M	SiL	
			10YR 5/8	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11-03-15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-551

Investigator(s): M.Boberg, S.Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 79.145285 Long: 42.390438 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X Hydric Soil Present? Yes ____ No X Wetland Hydrology Present? Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 551

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	50	Y	FACU
2. Fraxinus americana	30	Y	FACU
3. Acer saccharinum	10	N	FACW
4.			
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	20	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Dryopteris	30	Y	NI
2. Thelypteris noveboracensas	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	110	x 4 =	440
UPL species	0	x 5 =	0
Column Totals:	130 (A)		500 (B)

Prevalence Index = B/A = 3.84

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-55

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/3	100					SiL	
8-20	10YR 4/2	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-555

Investigator(s): M BOBERG B. VIRTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.157559 Long: 42.394865 Datum: NAD 83

Soil Map Unit Name: Erie Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation YES, Soil YES, or Hydrology YES significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL A552

Remarks: (Explain alternative procedures here or in a separate report.)

ACTIVE CORN FIELD

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-SSS

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. NOT APPLICABLE			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. NOT APPLICABLE			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 3')			
1. Agrostis stolonifera	32	Y	FACW
2. Eleocharis acicularis	6	N	OBL
3. Bidens aristosa	5	N	FACW
4. Zea mays	2	N	NI
5. Galium boreale	2	N	FAC
6. Plantago lanceolata	2	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	50 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. NOT APPICABLE			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 555

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 4/2	95	10YR 5/8	5	C	M	SIL	
2-10	2.5Y 3/2	90	10YR 5/8	8	C	M	SIL	
			2.5Y 5/2	2	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-556

Investigator(s): M BOBERG B VIRTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): FLAT Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.157363 Long: 42.394933 Datum: NAD 83

Soil Map Unit Name: Langford silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ~~NO~~ YES, Soil YES, or Hydrology YES significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

ACTIVE CORN FIELD

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3) BV
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No X Depth (inches): 0 BV

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-356

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Trifolium repens	15	Y	FACU
2. Zea mays	10	Y	NI
3. Plantago lanceolata	5	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: 30)			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	20 (A)		80 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-556

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0"-16"	2.5y 4/2	~~4/2~~ 90	10yR 5/8	10	C	m	SIL	
BV ~~16"-20"~~	~~10yR~~ 10yR							
16"-20"	2.5y 5/4	80	2.5y 4/2	10	D	m	SIL	
			10yR 5/8	10	C	m		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

Soils are within a cropped Ag. Field

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-557

Investigator(s): M. Boberg B. Viets Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.148389 Long: 42.393333 Datum: NAD 83

Soil Map Unit Name: Erie Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A531

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-537

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Euthamia graminifolia	55	Y	FAC
2. Scirpus cyperinas	10	N	OBL
3. Carex flava	10	N	OBL
4. Onoclea sensibilis	10	N	FACW
5. Eupatorium perfoliatum	5	N	FACW
6. Juncus effusus	5	N	OBL
7. Equisetum arvense	5	N	FAC
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-557

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	2.5Y 2.5/1	90	2.5Y 4/1	5	C	M	SiL	
			10YR 5/8	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-558

Investigator(s): M. Boberg B. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONVEX Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.148478 Long: 42.393237 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 558

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	30	Y	FACU
2. Fraxinus americana	20	Y	FACU
3. Acer rubrum	20	Y	FAC
4. Prunus serotina	10	N	FACU
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	10	Y	FACU
2. Prunus serotina	10	Y	FACU
3. Tsuga canadensis	5	N	FACU
4. Betula alleghaniensis	5	N	FAC
5. ~~Fagus americana~~	~~5~~	no	
6. Fagus grandifolia	5	N	FACU
7.			
	35	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Rubus idaeus	15	Y	FACU
2. Dryopteris intermedia	5	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	135 (A)		510 (B)

Prevalence Index = B/A = 3.77

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 558

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-12"	10yR3/3	80	10yR4/3	20	C	M	SIL	
12"-20"	10yR4/3	85	10yR5/4	10	C	M	SIL	
			10yR5/8	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-359

Investigator(s): M. BOBERG B. VIRTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): CONCAVE Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.149533 Long: 42.395668 Datum: NAD 83

Soil Map Unit Name: Ashville silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WLA534

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-1"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-359

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Euthamia graminifolia	70	Y	FAC
2. Carex flava	10	N	OBL
3. Salix petiolaris	10	N	FACW
4. Juncus effusus	5	N	OBL
5. Scirpus cyperinas	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-559

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5"	2.5Y 2.5/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-5(a)

Investigator(s): M. Berg B Wilts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.149646 Long: 42.395661 Datum: NAD 83

Soil Map Unit Name: Ashville silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- SLO

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceous	85	Y	FACU
2. Trifolium repens	15	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 0	x 2 = 0
FAC species 0	x 3 = 0
FACU species 100	x 4 = 400
UPL species 0	x 5 = 0
Column Totals: 100 (A)	400 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-560

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12"	2.5Y 3/2	95	7.5YR 3/4	5	C	M	SIL	
12"-20"	2.5Y 5/4	80	2.5Y 4/2	15	D	M	SL	
			10YR 4/6	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-561

Investigator(s): M. BOBERG B. VIRTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.149841 Long: 42.397062 Datum: NAD 83

Soil Map Unit Name: Busti silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A535
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-SU1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	25	Y	FACU
2. Fraxinus americana	25	Y	FACU
3. Betula nigra	10	N	FACW
4.			
5.			
6.			
7.			
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fraxinus americana	40	Y	FACU
2. Acer saccharum	25	Y	FACU
3. Betula nigra	10	N	FACW
4.			
5.			
6.			
7.			
	75	= Total Cover	

Herb Stratum (Plot size: 15')			
1. Dryopteris intermedia	5	Y	FAC
2. Equisetum arvense	5	Y	FAC
3. Euthamia graminifolia	5	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	15	x 3 =	45
FACU species	115	x 4 =	460
UPL species	0	x 5 =	0
Column Totals:	150 (A)		545 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Trees are using adaptations in wetland.

- Fluting
- Shallow rooting
- utilizing microtopographic relief.
- White Ash
- sugar maple

SOIL

Sampling Point: DP-SU1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 2.5/1	98	7.5YR 5/8	2	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/04/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-562

Investigator(s): M. Bodera B. VINTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.150022 Long: 42.397047 Datum: NAD 83

Soil Map Unit Name: Busti silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-502

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	50	Y	FACU
2. Populus tremuloides	15	Y	FACU
3. Prunus serotina	10	N	FACU
4.			
5.			
6.			
7.			
	75	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	30	Y	FACU
2. Populus tremuloides	20	Y	FACU
3. Fagus grandifolia	10	N	FACU
4.			
5.			
6.			
7.			
	60	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Rubus idaeus	20	Y	FACU
2. Dryopteris intermedia	5	N	FAC
3. Fragaria vesca	5	N	NI
4. Fagus grandifolia	5	N	FACU
5. Acer saccharum	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. NOT APPLICABLE			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	165	x 4 =	660
UPL species	0	x 5 =	0
Column Totals:	170 (A)		675 (B)

Prevalence Index = B/A = 3.97

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-502

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1"	2.5Y 2.5/1	100					SIL	
1-16"	10YR 3/3	100					SIL	
16-20	10YR 2/1	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/05/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-568

Investigator(s): M. Boberg S. Buckermeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR-R Lat: 79.164332 Long: 42.404195 Datum: NAD 83

Soil Map Unit Name: Erie Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL17539

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-3"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-568

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	50	Y	FACW
2. Salix petiolaris	10	N	FACW
3. Cornus racemosa	10	N	FAC
4.			
5.			
6.			
7.			
	70 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Equisetum arvense	5	Y	FAC
2. Eupatorium perfoliatum	5	Y	FACW
3. Typha angustifolia	5	Y	OBL
4. Juncus effusus	5	N	OBL
5. Phalaris arundinacea	5	N	FACW
6. Euthamia graminifolia	5	N	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-508

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	2.5Y 3/1	90	10YR 5/8	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/06/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-569

Investigator(s): M. Boberg, S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.119752 Long: 42.445767 Datum: NAD 83

Soil Map Unit Name: Erie silt loam NWI classification: Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A540
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-569

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Carex flava	10	Yes	OBL
2. Onoclea sensibilis	10	Yes	FACW
3. Thelypteris noveboracensis	5	No	FAC
4. Symphytrichum pilosum	2	No	FAC
5. Acer saccharum	1	No	FACU
6. Fraxinus americana	1	No	FACU
7. Rubus idaeus	1	No	FACU
8.			
9.			
10.			
11.			
12.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ✓ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- SW9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 3/1	90	10YR 5/6	5	C	M	SIL	
			10YR 6/3	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/06/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-570

Investigator(s): S. Buckenmeyer, M. Boberg Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.119699 Long: 42.445857 Datum: NAD 83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X Hydric Soil Present? Yes ____ No X Wetland Hydrology Present? Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 570

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	45	Yes	FACU
2. Acer saccharum	25	Yes	FACU
3. Tsuga canadensis	5	No	FACU
4.			
5.			
6.			
7.			
	75	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Dryopteris intermedia	6	Yes	FAC
2. Thelypteris noveboracensis	2	Yes	FAC
3. Rubus idaeus	2	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 30 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	8	x 3 =	24
FACU species	82	x 4 =	328
UPL species		x 5 =	
Column Totals:	90 (A)		352 (B)

Prevalence Index = B/A = 3.91

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 570

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/2	100					SIL	
1-20	2.5Y 5/4	80	10YR 4/2	20	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/06/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 571

Investigator(s): M. Boberg S. Buekenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 79.120654 Long: 42.445692 Datum: NAD 83

Soil Map Unit Name: Langford silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WLA541
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-4"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-571

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Carex flava	20	Y	OBL
2. Typha angustifolia	10	Y	OBL
3. Euthamia graminifolia	10	Y	FAC
4. Symphyotrichum novae angliae	10	N	FACW
5. Onoclea sensibilis	10	N	FACW
6. Juncus effusus	5	N	OBL
7. Carex intumescens	5	N	FACW
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-571

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	2.5Y 2.5/1	90	10YR 5/8	10	C	M	SIC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/03/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-572

Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 79.120813 Long: 42.445855 Datum: NAD 83

Soil Map Unit Name: Langford silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL A542

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-1"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 572

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	1	Y	FACU
2. Lonicera tatarica	1	Y	FACU
3.			
4.			
5.			
6.			
7.			
	2 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Carex flava	15	Y	OBL
2. Onoclea sensibilis	15	Y	FACW
3. Euthamia graminifolia	15	Y	FAC
4. Juncus effusus	10	N	OBL
5. Eupatorium perfoliatum	5	N	FACW
6. Polygonum artifolium	5	N	OBL
7. Carex intumescens	5	N	FACW
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	25	x 2 =	50
FAC species	15	x 3 =	45
FACU species	7	x 4 =	28
UPL species	0	x 5 =	0
Column Totals:	77 (A)		153 (B)

Prevalence Index = B/A = 1.98

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-372

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16"	2.5Y 3/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: CHAUTAUQUA CTY Sampling Date: 11/9/15

Applicant/Owner: Bell Hill Wind Energy, LLC State: NY Sampling Point: DP A575

Investigator(s): B. Viets, S. Buckenmeyer Section, Township, Range: VILLENOVA

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.118433 Long: 42.463273 Datum: NAD 83

Soil Map Unit Name: Fremont Silt loam 0 to 3% Slopes NWI classification: Inland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: Wetland A543

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0"-4"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-A575

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Agrostis stolonifera	40	Y	FACW
2. Bidens aristosa	20	Y	FACW
3. ~~10~~	~~10~~	N	
4. Eupatorium perfoliatum	15	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-AS75

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-10"	2.5Y 3/2	95	7.5yR 4/6	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua CTY Sampling Date: 11/9/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-576

Investigator(s): B. Viers, S. Bickermeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2%

Subregion (LRR or MLRA): LRR-R Lat: 79.118439 Long: 42.453234 Datum: nad 83

Soil Map Unit Name: Fremont Si. Ft loam 0 to 3% Slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP 576

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceous	65	Y	FACU
2. Trifolium repens	10	N	FACU
3. Euthamia graminifolia	5	N	FAC
4. Ranunculus bulbosus	5	N	FACW
5. Daucus carota	5	N	UPL
6. Solanum carolinense	5	N	FACU
7. Juncus effusus	5	N	OBL
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species	80	x 4 =	320
UPL species	5	x 5 =	25
Column Totals:	100 (A)		375 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP 576

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-9"	2.5Y 3/2	100					SIL	
9"-20"	2.5Y 3/2	85	2.5Y 4/2	10%	D	M	SIL	
			7.5YR 4/6	5%	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Cty Sampling Date: 11/9/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-577

Investigator(s): B. Viets, S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.119116 Long: 42.452562 Datum: nad 83

Soil Map Unit Name: Orpark silt loam 3 to 8% slopes NWI classification: Wetland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland N514
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ___	Depth (inches):	6"-11"
Water Table Present?	Yes X No ___	Depth (inches):	0"
Saturation Present? (includes capillary fringe)	Yes X No ___	Depth (inches):	0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-577

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	55	Y	OBL
2. Phalaris arundinacea	20	Y	FACW
3. Eleocharis acicularis	5	N	OBL
4. Carex intumescens	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling Point: DP-577

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	10yR4/1	70	5yR 3/4	25	C	PL	SIL	
			2.5y 7/6	5	C	m		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: CHAUTAUQUA CTY Sampling Date: 11/9/15

Applicant/Owner: Bell Hill Wind Energy, LLC State: NY Sampling Point: DP-578

Investigator(s): B. VIRTJ, S. Bodenmeyer Section, Township, Range: VILLENOVA

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1%

Subregion (LRR or MLRA): LRR-R Lat: 79.119236 Long: 42.452602 Datum: NAD83

Soil Map Unit Name: Orpark Silt loam, 3 to 8% Slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling Point: DP-578

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceous	60	Y	FACU
2. Trifolium repens	25	Y	FACU
3. plantago lanceolata	5	N	FACU
4. Taraxacum officinale	5	N	FACU
5. Solanum carolines	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling Point: DP-S78

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-20"	10yr 3/4	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: CHAUTAUQUA CTY Sampling Date: 11/9/15

Applicant/Owner: Bell Hill Wind energy, LLC State: NY Sampling Point: DP-579

Investigator(s): R. Viris, S. Buckmeyer Section, Township, Range: VILLENOVA

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.119608 Long: 42.450179 Datum: nad 83

Soil Map Unit Name: _____ NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A516

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches):

Water Table Present? Yes X No ___ Depth (inches): 6"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-579

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus americana	10	Y	FACU
2. Tsuga canadensis	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Lindera benzoin	15	Y	FACW
2. Tsuga canadensis	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Matteuccia struthiopteris	25	Y	FAC
2. Dryopteris cristata	15	Y	OBL
3. Onoclea sensibilis	10	N	FACW
4. Rosa multiflora	5	N	FACU
5. Bidens aristosa	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	30	x 2 =	60
FAC species	25	x 3 =	75
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	100 (A)		270 (B)

Prevalence Index = B/A = 2.70

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-579

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-10"	2.5Y 3/2	98	7.5YR 4/3	40%	C	M	SI	
			10YR 5/6	2%	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bail Hill Wind Project City/County: Chautauqua City Sampling Date: 11/9/15

Applicant/Owner: Bail Hill Wind Energy, LLC State: ny Sampling Point: DP-580

Investigator(s): B Viars, S. Breckenridge Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 2%

Subregion (LRR or MLRA): LRR-R Lat: 79.11964 Long: 42.449912 Datum: nad 83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil No, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-SBC

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	80	Y	FACU
2. Betula alleghaniensis	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
	100 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	30	Y	FACU
2. Fagus grandifolia	10	Y	FACU
3. Carpinus caroliana	10	Y	FAC
4.			
5.			
6.			
7.			
	50 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Fagus grandifolia	5	Y	FACU
2. Tsuga canadensis	5	Y	FACU
3. Dryopteris cristata	5	X	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 37 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	130	x 4 =	520
UPL species	0	x 5 =	0
Column Totals:	165 (A)		615 (B)

Prevalence Index = B/A = 3.72

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-580

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-2"	7.5yr2.5/1	100%					N/A	organic layer
2"-14"	2.5y 5/6	90%	7.5yr2.5/1	10%			SIL	organics within Soils
14"-20"	2.5y4/4	100%					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: Chautauqua CTY Sampling Date: 11/09/15
Applicant/Owner: ~~B. Virts, S. Buckenmeyer~~ Bell Hill Wind Energy LLC State: NY Sampling Point: DP-581
Investigator(s): B. Virts, S. Buckenmeyer Section, Township, Range: VILLENOVA
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: 79.119414 Long: 42.448568 Datum: Nad 83
Soil Map Unit Name: Valois gravelly Silt loam, Rolling NWI classification: ~~Wetland~~ SB Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: wetland A547

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-2"
Water Table Present? Yes X No ____ Depth (inches): 0"
Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-581

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	30	Y	FACU
2. Betula alleghaniensis	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	30	Y	FACU
2. Betula alleghaniensis	10	Y	FAC
3. Fagus grandifolia	5	N	FACU
4. Fraxinus americana	5	N	FACU
5.			
6.			
7.			
	50	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Glyceria cuticfera	15	Y	OBL
2. Dryopteris cristata	10	Y	OBL
3. Carex intumescens	5	N	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-581

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 3/2	90	10YR 3/6	10	C	M	SI	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua CTY Sampling Date: 11/9/15

Applicant/Owner: Ball Hill Wind energy, LLC State: NY Sampling Point: DP582

Investigator(s): B. Vess, S. Buckenmyer Section, Township, Range: VILLENOVA

Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): Convex Slope (%): 1%

Subregion (LRR or MLRA): LRR-R Lat: 79.119808 Long: 42.44868 Datum: NAD 83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes X	No ~~X~~ MB	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 4"

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-SS2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	65	Y	FACU
2. Carpinus caroliana	5	N	FACU
3. Fraxinus americana	5	N	FACU
4. Acer saccharum	5	N	FACU
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	20	Y	FACU
2. Carpinus caroliana	5	N	FACU
3. Fagus grandifolia	5	N	FACU
4.			
5.			
6.			
7.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Fagus grandifolia	5	Y	FACU
2. Dryopteris cristata	5	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	115	x 4 =	460
UPL species	0	x 5 =	0
Column Totals:	120 (A)		465 (B)

Prevalence Index = B/A = 3.87

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling Point: DP-582

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2"	leaf litter layer							
0"-2"	7.5YR2.5/1	100%					SI	
2"-20"	2.5Y4/4	80	10YR5/8	20	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: CHAUTAUQUA CTY Sampling Date: 11/10/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-548 BV 583

Investigator(s): B. VIRTS Section, Township, Range: VILLENOVA

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 21

Subregion (LRR or MLRA): LRR-R Lat: 79.123487 Long: 42.447216 Datum: NAD 83

Soil Map Unit Name: Ashville silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: wetland A548
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No ___	Depth (inches): 3"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP 583 SB

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	50	Y	FACU
2. Fraxinus americana	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	30	Y	FACU
2. Fraxinus americana	10	Y	FACU
3. Acer rubrum	10	Y	FAC
4.			
5.			
6.			
7.			
	50	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Dryopteris cristata	10	Y	OBL
2. Onoclea sensibilis	10	Y	FACW
3. Tsuga canadensis	5	N	FACU
4. Agrostis stolonifera	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	15	x 2 =	30
FAC species	10	x 3 =	30
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	140 (A)		490 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

- __ 1 - Rapid Test for Hydrophytic Vegetation
- __ 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- __ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

- species have adapted to living in wet conditions through morphological adaptations – fluted trunks and shallow roots
- Eastern Hemlock + White Ash.

SOIL

Sampling Point: PP-583

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-10"	10yr 2/1	98	10yr 3/6	2	C	M	SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: CHAUTAUQUA CTY Sampling Date: 11/10/15

Applicant/Owner: Bell Hill Wind Energy, LLC State: NY Sampling Point: DP-581

Investigator(s): B. VIRTS Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2%

Subregion (LRR or MLRA): LRR R Lat: 79.123914 Long: 42.447289 Datum: NAD83

Soil Map Unit Name: Ashville Silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-SB4

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	25	Y	FACU
2. Tsuga canadensis	10	Y	FACU
3. Fraxinus americana	10	Y	FACU
4. Betula allegheniensis	5	N	FAC
5.			
6.			
7.			
	50	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	20	Y	FACU
2. Fraxinus americana	10	Y	FACU
3. Fagus grandifolia	5	N	FACU
4. Lonicera tatarica	5	N	FACU
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Dryopteris cristata	10	Y	OBL
2. Polystichum acrostichoides	10	Y	FACU
3. Fagus americana	5	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 12.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	115 (A)		425 (B)

Prevalence Index = B/A = 3.69

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-581

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-1"	2.5Y2.5/1	95	2.5Y4/6	5	C	M	SI	
1"-20"	2.5Y4/3	95	2.5Y3/1	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: Chautauqua Co. Sampling Date: 11/10/15

Applicant/Owner: Bell Hill Wind Energy, LLC State: NY Sampling Point: DP585

Investigator(s): B. Viets Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Drainageway Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 19.12709 Long: 42.445981 Datum: NAD 83

Soil Map Unit Name: Valois Silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: Wetland A549	

Remarks: (Explain alternative procedures here or in a separate report.)

Wetland is Primarily a PFO with some minor areas of Rem

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0"-4"

Water Table Present? Yes X No ____ Depth (inches): 0"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DPSBS

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	58	Y	FACU
2. Betula allegenensis	20	Y	FAC
3. Acer rubrum	5	N	FAC
4.			
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	30	Y	FACU
2. Betula allegenensis	10	Y	FAC
3. Fraxinus americana	5	N	FACU
4. Betula ~~allegenensis~~ populifolia	5	N	FAC
5.			
6.			
7.			
	50	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Dryopteris cristatas	18	Y	OBL
2. Rubus idaeus crispato	5	N	FACU
3. Agrostis stolonifera	5	N	FACW
4. Phalaris arundinacea	2	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	18	x 1 =	18
FACW species	7	x 2 =	14
FAC species	40	x 3 =	120
FACU species	93	x 4 =	380
UPL species	0	x 5 =	0
Column Totals:	160 (A)		532 (B)

Prevalence Index = B/A = 3.32

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-585

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-10"	7.5 Y 3/2	40	2.5 Y 3/6	5	C	M	SIL	
			7.5 Y 6/8	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- [X] Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- [X] Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes [X] No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/10/15
Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP586
Investigator(s): B Virts Section, Township, Range: Villenova
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3
Subregion (LRR or MLRA): LRR-R Lat: 79.132298 Long: 42.44611 Datum: NAD 83
Soil Map Unit Name: Valois gravelly silt loam, Rolling NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X Hydric Soil Present? Yes ____ No X Wetland Hydrology Present? Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):
Water Table Present? Yes ____ No X Depth (inches):
Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 586

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	35	Y	FACU
2. Acer saccharum	10	Y	FACU
3. Betula alleghaniensis	5	N	FAC
4.			
5.			
6.			
7.			
	50	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	15	Y	FACU
2. Fagus grandifolia	15	Y	FACU
3. Acer saccharum	10	Y	FACU
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Rubus idaeous	30	Y	FACU
2. Dryopteris intermedia	10	Y	FAC
3. Fagus grandifolia	10	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 12.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	125	x 4 =	500
UPL species	0	x 5 =	0
Column Totals:	140 (A)		545 (B)

Prevalence Index = B/A = 3.89

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 586

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-1"	10yr 3/2	100					SL	
1"-20"	10yr 5/6	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill wind Project City/County: Chautauqua Sampling Date: 11/11/15

Applicant/Owner: Ball Hill Wind Energy, LLC. State: NY Sampling Point: 595

Investigator(s): M. Boberg R. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.121248 Long: 42.442435 Datum: NAD-83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation NO, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes Y No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A552
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0-1"
Water Table Present?	Yes X	No ___	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: 595

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. ~~Carex flava~~ Juncus effusus	70	Y	OBL
2. Carex flava	10	N	OBL
3. Ranunculus bulbosus	10	N	FACW
4. Mentha spicata	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 595

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10"	2.5Y 3/1	90	10YR 5/8	5	C	M	SIL	
			10YR 6/4	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: Chautauqua City Sampling Date: 11/11/15

Applicant/Owner: Bell Hill Wind Energy, LLC State: NY Sampling Point: 596

Investigator(s): B. Vitts, M. Bobery Section, Township, Range: VILLENOVA

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 79.121197 Long: 42.442227 Datum: NAD 83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-596

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 6')			
1. Schedonorus arundinaceous	50	Y	FACU
2. Trifolium repens	20	Y	FACU
3. Juncus effusus	10	N	OBL
4. Rosa multiflora	10	N	FACU
5. Daucus carota	5	N	UPL
6. Plantago lanceolata	5	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	85	x 4 =	340
UPL species	5	x 5 =	25
Column Totals:	100 (A)		375 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-596

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-2"	2.5Y 3/3	95	10YR 5/8	5	C	M	SIL	
2"-16"	2.5Y 3/3	100					SIL	
16"-20"	10YR 5/6	100	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/11/2015

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-597

Investigator(s): M.Boberg B.Viirs Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR or MLRA): LRR-R Lat: 79.121464 Long: 42.44157 Datum: NAD-83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A359

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-1"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 597

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Carex intumescens	60	Y	FACW
2. Juncus effusus	15	N	OBL
3. Typha latifolia	15	N	OBL
4. Carex flava	5	N	OBL
5. Lythrum salicaria	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling Point: 597

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	2.5Y 3/1	95	5YR 3/4	5	C	M/PL	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/11/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: 398

Investigator(s): M. Boberg B. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.121374 Long: 42.441687 Datum: NAD83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: 5A8

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina	20	Y	FACU
2. Populus tremuloides	15	Y	FACU
3. Acer saccharum	5	N	FACU
4.			
5.			
6.			
7.			
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Rhamnus cathartica	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Trifolium repens	30	Y	FACU
2. Schedonorus arundinaceous	30	Y	FACU
3. Pantago lanceolata	10	N	FACU
4. Dacicus pusillus	5	N	NI
5. Fragaria vesca	5	N	NI
6. Taraxacum officinale	5	N	FACU
7. Euthamia graminifolia	5	N	FAC
8. Daucus carota	5	N	UPL
9. Rosa multiflora	5	N	FACU
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	125	x 4 =	500
UPL species	5	x 5 =	25
Column Totals:	135 (A)		540 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 598

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/3	100					S	
6-9	2.5Y 6/8	80	2.5Y 3/3	15	D	M	SIL	
			10YR 5/8	5	C	M	SIL	
9-20	10YR 3/6	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind City/County: Chautauqua Sampling Date: 11/11/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: 599

Investigator(s): M. Boberg B. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.121369 Long: 42.44105 Datum: NAD83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A560

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 0-1"
Water Table Present?	Yes X	No ___	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 599

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	40	Y	OBL
2. Polygonum persicaria	20	Y	NI
3. Eupatorium perfoliatum	15	N	FACW
4. Carex flava	10	N	OBL
5. Eleocharis aeicularis	5	N	OBL
6. Euthamia graminifolia	5	N	FAC
7. Rumex crispus	5	N	FAC
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	55	x 1 =	55
FACW species	15	x 2 =	30
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		115 (B)

Prevalence Index = B/A = 1.43

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 599

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	2.5Y 3/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/11/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: U100

Investigator(s): M. Bilberg B. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.172339 Long: 42.440976 Datum: Upland

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 9"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 9"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: 600

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceous	60	Y	FACU
2. Trifolium repens	30	Y	FACU
3. Pantago lanceolata	8	N	FACU
4. Juncus effusus	1	N	OBL
5. Juncus tenius	1	N	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	0	x 2 =	0
FAC species	1	x 3 =	3
FACU species	98	x 4 =	392
UPL species	0	x 5 =	0
Column Totals:	100 (A)		396 (B)

Prevalence Index = B/A = 3.96

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: L003

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	2.5Y 3/2	95	10YR 3/6	5	C	M/PL	SIL	
13-20	2.5Y 3/2	85	2.5Y 3/1	5	D	M	SIL	
			10YR 3/6	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind City/County: Chautauqua Sampling Date: 11/11/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: WL01

Investigator(s): M. Bolberg B. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.119456 Long: 42.440737 Datum: NAD-83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A501

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes X No ____ Depth (inches): 8"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: W01

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	80	Y	OBL
2. Eleocharis acicularis	10	N	OBL
3. Eupatorium perfoliatum	5	N	FACW
4. Scirpus cyperinas	5	N	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 8/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: BALL HILL WIND PROJECT City/County: Chautauqua Sampling Date: 11/11/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: 002

Investigator(s): M Boberg B Yirts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.119253 Long: 42.440761 Datum: NAD83

Soil Map Unit Name: NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 6002

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceus	60	Y	FACU
2. Trifolium repens	25	Y	FACU
3. Daucus carota	5	N	UPL
4. Daucus pusillus	5	N	NI
5. Juncus effusus	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	85	x 4 =	340
UPL species	5	x 5 =	25
Column Totals:	95 (A)		370 (B)

Prevalence Index = B/A = 3.89

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: UPDZ

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/2	98	10YR 5/8	2	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bail Hill Wind Project City/County: Chautauqua Cty Sampling Date: 11/12/2015

Applicant/Owner: Bail Hill Wind Energy, LLC State: NY Sampling Point: DP-604

Investigator(s): B. Virts, S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR-R Lat: 79.116115 Long: 42.440785 Datum: Nad 83

Soil Map Unit Name: Chautauqua silt loam, 3-8% slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	A562
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X No ____	Depth (inches):	0"
Water Table Present?	Yes X No ____	Depth (inches):	0"
Saturation Present? (includes capillary fringe)	Yes X No ____	Depth (inches):	0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-604

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	20	Yes	OBL
2. Carex flava	20	Yes	OBL
3. Schedurorus arundinaceus	33	Yes	FACU
4. Trifolium Repens	5	NO	FACU
5. Taraxacum officinale	5	NO	FACU
6. Ranunculus Bulbosus	2	NO	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-604

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: Chautauqua CTY Sampling Date: 11/12/2015
Applicant/Owner: Bell Hill Wind Energy, LLC State: NY Sampling Point: DP-605
Investigator(s): B. Viets, S. Buckenmeyer Section, Township, Range: Villenova
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 2-3
Subregion (LRR or MLRA): LRR-R Lat: 79.115942 Long: 42.440811 Datum: NAD 83
Soil Map Unit Name: Chautauqua silt loam 3-8% slopes NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-605

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Trifolium Repens	50	Yes	FACU
2. Taraxacum officinale	20	Yes	FACU
3. Schedonorus arundinaceus	18	NO	FACU
4. Daucus carota	5	NO	UPL
5. Rosa multiflora	5	No	FACU
6. Solanum Carolinense	2	NO	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	95	x 4 =	380
UPL species	5	x 5 =	25
Column Totals:	100 (A)		405 (B)

Prevalence Index = B/A = 4.05

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-605

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR 3/4	100					SiL	
11-20	2.5Y 5/6	90	10YR 3/4	10	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua CTY Sampling Date: 11/12/2015
Applicant/Owner: Ball Hill Wind energy, LLC State: NY Sampling Point: DP-606
Investigator(s): B. Viets, S. Buckenmeyer Section, Township, Range: Villenova
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 2-3
Subregion (LRR or MLRA): Lat: 79.114576 Long: 42.440212 Datum: NAD 83
Soil Map Unit Name: Busti silt loam, 3-8% slopes NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: A564

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-606

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Typha angustifolia	30	Yes	OBL
2. Juncus effusus	20	Yes	OBL
3. Carex flava	15	NO	OBL
4. Schedonorus arundinaceus	10	No	FACU
5. Euthamia graminifolia	5	NO	FAC
6. Bidens aristosa	5	NO	FACW
7. Alisma triv.	5	NO	OBL
8.			
9.			
10.			
11.			
12.			
	90 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-606

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 3/1	80	10YR 5/8	20	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua - CTY Sampling Date: 11/12/2015

Applicant/Owner: Ball Hill Wind energy, LLC State: NY Sampling Point: DP-607

Investigator(s): B. Virts, S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 2-3

Subregion (LRR or MLRA): LRR-R Lat: 79.114542 Long: 42.440291 Datum: NAD83

Soil Map Unit Name: Busti silt loam, 3-8% slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sampling Point: DP-607

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Schedonorus arundinaceus	35	Yes	FACU
2. Trifolium repens	25	Yes	FACU
3. Taraxacum officinale	25	Yes	FACU
4. Solidago canadensis	10	No	FACU
5. Daucus carota	5	No	UPL
6.			
7.			
8.			
9.			
10.			
11.			
12.	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	95	x 4 =	380
UPL species	5	x 5 =	15
Column Totals:	100 (A)		395 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling Point: DP-607

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15	2.5Y 4/4	100					SIL	
15-20	2.5Y 6/2	88	10YR 2/1	10	C	M	SIL	
			10YR 5/8	2	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: Chautauqua Cty Sampling Date: 11/12/15

Applicant/Owner: Bell Hill Wind Energy, LLC State: NY Sampling Point: DP-610

Investigator(s): B. Yates, S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.114078 Long: 42.43755 Datum: NAD 83

Soil Map Unit Name: Busti silt loam 3-8% slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A565
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

wetland is a patmed PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0"-2"
Water Table Present?	Yes X	No ____	Depth (inches): 6"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-610

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	25	Yes	OBL
2. Carex Flava	25	Yes	OBL
3. Mentha Spicata	25	Yes	FACW
4. Eupatorium perfoliatum	20	Yes	FACW
5. Ranunculus bulbosus	5	NO	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-610

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-5"	2.5Y 2.5/1	100					SI	
5"-20"	2.5Y 4/1	98	10YR 5/6	2	C	M	SI	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Hill Wind Project City/County: Chautauqua Cty Sampling Date: 11/12/15

Applicant/Owner: Bell Hill Wind Energy LLC State: NY Sampling Point: DP-611

Investigator(s): B. Viets, S. Brickmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 10%

Subregion (LRR or MLRA): LRR-R Lat: 79.114195 Long: 42.437799 Datum: NAD 83

Soil Map Unit Name: BlsB: Silt loam 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-611

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Trifolium Repens	50	Yes	FACU
2. Schedonorus arundinaceus	40	Yes	FACU
3. Taraxacum officinale	5	NO	FACU
4. Plantago lanceolata	5	NO	FACU
5. Ranunculus bulbosus	10	NO	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	100 (A)		380 (B)

Prevalence Index = B/A = 3.80

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Sampling Point: DP-611

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	2.5Y 4/1	80	2.5Y 6/3	15	C	M	SIL	
			10YR 5/6	5	C	M		
11-18	2.5Y 4/1	55	2.5Y 6/4	25	C	M	SIL	
			10YR 5/8	20	C	M		
18-20	2.5Y 4/2	60	7.5YR 4/6	40	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bull Hill Wind Project City/County: Chautauqua Cty Sampling Date: 11/12/13

Applicant/Owner: Bull Hill Wind Energy, LLC State: NY Sampling Point: DP-613

Investigator(s): B. Vias, S. Buckenmeyer Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 79.112189 Long: 42.435276 Datum: NAD 83

Soil Map Unit Name: Chenango Channery Loam, Fan, 3-8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A367

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No ___	Depth (inches): 3"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-613

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Rhamnus cathartica	20	Yes	FACU
2. Cornus alba	10	Yes	FACW
3. Hamamelis virginiana	10	Yes	FACU
4. Fraxinus americana	5	no	FACU
5. Ostrya virginiana	5	no	FACU
6. Rosa multiflora	10	Yes	FACU
7.			
	60 ~~50~~ BV = Total Cover		

Herb Stratum (Plot size: 5')			
1. Cornus alba	15	Yes	FACW
2. Rosa multiflora	5	Yes	FACU
3. Epilobium anagallidifolium	5	Yes	FACW
4. Rumex crispus	5	Yes	FAC
5. Euthrochium maculatum	5	Yes	OBL
6. Symphytrichum pilosum	5	Yes	FAC
7. Eutrochium dubium	5	Yes	FAC
8.			
9.			
10.			
11.			
12.			
	45 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 11 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 63.6 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-613

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	90	10YR 3/6	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bull Hill Wind Project City/County: Chautauqua Cty Sampling Date: 11/12/15

Applicant/Owner: Bull Hill Wind Energy State: NY Sampling Point: DP-614

Investigator(s): B. Viets, S. Blackmanger Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1%

Subregion (LRR or MLRA): LRR-R Lat: 79.112211 Long: 42.43534 Datum: nad 83

Soil Map Unit Name: Chenango channery loam, 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Area is Road shoulder Adjacent to Wetland A567

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: OP-614

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Poa Pretensis	60	Yes	FACU
2. Elymus villosus	15	no	FACU
3. Daucus Carota	10	no	UPL
4. Rumex Crispus	5	no	FAC
5. Taraxacum officinale	5	no	FACU
6. Cirsium discolor	5	no	UPL
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	80	x 4 =	320
UPL species	15	x 5 =	2575
Column Totals:	100 (A)		410 (B)

Prevalence Index = B/A = 4.10

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-614

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-20"	2.5Y 4/2	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bail Hill Wind Project City/County: Chautauqua City Sampling Date: 11/13/15

Applicant/Owner: Bail Hill Wind Energy, LLC State: NY Sampling Point: DP-617

Investigator(s): B. Virts Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR or MLRA): LRR-R Lat: 79.112856 Long: 42.432927 Datum: nad 83

Soil Map Unit Name: Chautauqua silt loam 3-8% slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: WETland A570

Remarks: (Explain alternative procedures here or in a separate report.)

Grazed Pem slope wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0 1/2 3"
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-617

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	30	Y	OBL
2. Scirpus atrovirens	5	N	OBL
3. Ranunculus bulbosus	10	N	FAC
4. Carex flava	45	Y	OBL
5. Eleocharis spp.	10	—	—
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP617

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-9"	10yr 4/1	95	10yr 3/6	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua City Sampling Date: 11/13/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-618

Investigator(s): B. Viets Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): Convex Slope (%): 3%

Subregion (LRR or MLRA): LRR-R Lat: 79.112794 Long: 42.432798 Datum: NAD83

Soil Map Unit Name: Chautauqua silt loam 3-8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No	
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes _____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-618

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Trifolium repens	60	Y	FACU
2. Ranunculus bulbosus	5	N	FAC
3. Plantago lanceolata	10	N	FACU
4. Taraxacum officinale	10	N	FACU
5. Schedonorus arundinaceous	15	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-618

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-14"	10YR 3/3	95	10YR 3/6	5	C	M	SIL	
14"-20"	10YR 5/2	70	2.5Y 3/3	20	C	M	SIL	
			10YR 5/6	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: BAll Hill Wind Project City/County: CHAUTAUQUA CTY Sampling Date: 11/13/15

Applicant/Owner: BAll Hill Wind Energy, LLC State: NY Sampling Point: DP-622

Investigator(s): B. Virts, M. Boberg Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 79.12908 Long: 42.443007 Datum: NAD 83

Soil Map Unit Name: Busti Silt loam 0 to 3% slopes NWI classification: UPLAND

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WETLAND A578

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 2-8
Water Table Present?	Yes X	No ____	Depth (inches): 0
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-622

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	40	Y	FACW
2. Lonicera tatarica	15	Y	FACU
3. Rubus idaeus	10	N	FACU
4. Rosa multiflora	10	N	FACU
5.			
6.			
7.			
	75 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Cornus alba	15	Y	FACW
2. Ranunculus bulbosus	5	Y	FAC
3. Carex flava	5	Y	OBL
4. Symphyotichum pilosum	5	Y	FAC
5. Euthamia graminifolia	5	Y	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-622

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	10yr3/2	95	10yr4/6	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: CHAUTAUQUA CTY Sampling Date: 11/13/15

Applicant/Owner: Ball Hill Wind energy LLC State: NY Sampling Point: DP-623

Investigator(s): B. Viris, M. Bobery Section, Township, Range: Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 4

Subregion (LRR or MLRA): LRR-R Lat: 79.127223 Long: 42.441704 Datum: NAD83

Soil Map Unit Name: BrB: Silt loam 0 to 3% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes _____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-623

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus resinosa	95	Y	FACU
2. Prunus serotina	5	N	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Lonicera tatarica	10	Y	FACU
2. Pinus resinosa	10	Y	FACU
3. Rubus idaeus	10	Y	FACU
4. Fagus grandifolia	5	N	FACU
5.			
6.			
7.			
	35	= Total Cover	

Herb Stratum (Plot size: 5')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-623

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10yr3/3	100					SIL	
10-20	2.5, 5/6	85	10yr4/2	15	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/16/15
Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-625
Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Hanover
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: 42.44548448 Long: -79.12933903 Datum: NAD83
Soil Map Unit Name: Chautauqua silt loam NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation NO, Soil NO, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: WL-A579
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-12"
Water Table Present? Yes X No ____ Depth (inches): 0"
Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 025

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Alnus incana	10	Yes	FACW
2. Cornus racemosa	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Carex intumescens	15	No	FACW
2. Typha angustifolia	15	No	OBL
3. Polygonum arifolium	50	Yes	OBL
4. Leersia oryzoides	5	No	OBL
5. Epilobium ciliatum	5	No	FACW
6. Carex lupulina	5	No	OBL
7. Scirpus cyperinus	5	No	OBL
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 625

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	2.5Y 2.5/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/10/15
Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-1026
Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Hanover
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR or MLRA): LRR-R Lat: 42.445162 35 Long: -79.1287335 Datum: NAD83
Soil Map Unit Name: Chautauqua silt loam NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: WL-A580

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-1"
Water Table Present?	Yes X	No ____	Depth (inches): 6"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 626

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	30	Yes	OBL
2. Carex flava	30	Yes	OBL
3. Ranunculus bulbosus	20	Yes	FACW
4. Symphytrichum pilosum	10	No	FAC
5. Epilobium ciliatum	10	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60 SB	x 1 =	60 SB
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: U26

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	2.5Y 3/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/16/15
Applicant/Owner: Ball Hill Wind Energy State: NY Sampling Point: DP-027
Investigator(s): M.Boberg S. Buckenmeyer Section, Township, Range: Hanover
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: 42.44490263 Long: -79.12882435 Datum: NAD-83
Soil Map Unit Name: Fremont Silt Loam NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X Hydric Soil Present? Yes ____ No X Wetland Hydrology Present? Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):
Water Table Present? Yes ____ No ____ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 027

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. ~~Eutamagrostis canadensis~~ MB	~~15~~ MB		
2. Schedonorus arundinaceous	30	Y	FACU
3. Trifolium repens	20	Y	FACU
4. Taraxacum officinale	5	N	FACU
5. Plantago lanceolata	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60 ~~100~~ MB = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column Totals:	60 (A)		240 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: U27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20"	2.5Y 4/3	90	2.5Y 6/4	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (Inches):_____

Hydric Soil Present? Yes ____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/16/15
Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-1028
Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Hanover
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR or MLRA): LRR-R Lat: 42.44659163 Long: -79.13040717 Datum: NAD-83
Soil Map Unit Name: Fremont silt loam NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A581
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-1"
Water Table Present?	Yes X	No ____	Depth (inches): 0 to 5"
Saturation Present? (Includes capillary fringe)	Yes X	No ____	Depth (inches): 5"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: L28

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus racemosa	10	Y	FAC
2. Rhamnus cathartica	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Euthamia graminifolia	35	Y	FAC
2. Juncus effusus	20	Y	OBL
3. Carex flava	18	N	OBL
4. Polygonum arifolium	15	N	OBL
5. Leersia oryzoides	10	N	OBL
6. Cornus racemosa	2	N	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 1028

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9"	2.5Y 3/1	98	10YR 4/8	2	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Energy City/County: Chautauqua Sampling Date: 11/16/15
Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: WZ9
Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Hanover
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 0-3
Subregion (LRR or MLRA): LRR-R Lat: 42.44674723 Long: -79.13071287 Datum: NAD83
Soil Map Unit Name: Fremont silt loam NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation NO, Soil NO, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation NO, Soil NO, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No WMB	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):
Water Table Present? Yes ____ No ____ Depth (inches):
Saturation Present? (Includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: 629

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus americana	10	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Hamamelis virginiana	10	Y	FACU
2. Fraxinus americana	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	50	Y	FACU
2. Fragaria fresca	20	Y	NI
3. Schedonouros arundinaceus	20	Y	FACU
4. Carex flava	5	N	OBL
5. Fraxinus americana	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	105 (A)		405 (B)

Prevalence Index = B/A = 4.05

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes __ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 029

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20"	10YR 3/2	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/16/15
Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-630
Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Hanover
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: 42.44744133 Long: -79.13523777 Datum: NAD83
Soil Map Unit Name: Chautauqua silt loam NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No	**Is the Sampled Area within a Wetland?** Yes X No If yes, optional Wetland Site ID: WL-A582

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"
Water Table Present? Yes X No ____ Depth (inches): 5"
Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 3"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: L30

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	50	Yes	FACU
2. Fraxinus americana	20	Yes	FACU
3. Carpinus caroliniana	15	No	FAC
4. Acer saccharum	15	No	FACU
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	5	Yes	FACU
2. Acer saccharum	5	Yes	FACU
3. Alnus incana	5	Yes	FACW
4. Fraxinus americana	5	Yes	FACU
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Symphyotrichum vorae-angliae	8	Yes	FACW
2. Onoclea sensibilis	5	Yes	FACW
3. Carex flava	2	No	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 37.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	18	x 2 =	36
FAC species	15	x 3 =	45
FACU species	100	x 4 =	400
UPL species		x 5 =	
Column Totals:	135 (A)		483 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Species adapted to living in wet conditions. through morphological adaptations. Examples include flutted trunks, shallow roots. Species: Tsuga canadensis, Fraxinus americana, Acer saccharum.

SOIL Sampling Point: U30

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 2.5/1	90	10YR 5/8	10	C	M	SIL	
6-8	10YR 5/6	60	10YR 5/8	40	C	M	SIC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bail Hill Wind Project City/County: Chautauqua Sampling Date: 11/16/15
Applicant/Owner: Bail Hill Wind Energy, LLC State: NY Sampling Point: DP-1031
Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Hanover
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): 0
Subregion (LRR or MLRA): LRR-R Lat: 42.44716811 Long: -79.13266629 Datum: NAD83
Soil Map Unit Name: Fremont silt loam NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X Hydric Soil Present? Yes ____ No X Wetland Hydrology Present? Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):
Water Table Present? Yes ____ No ____ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: 631

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	20	Yes	FACU
2. Prunus serotina	20	Yes	FACU
3. Acer saccharum	20	Yes	FACU
4. Fraxinus americana	20	Yes	FACU
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	5	Yes	FACU
2. Acer saccharum	5	Yes	FACU
3. Fraxinus americana	5	Yes	FACU
4. Prunis serotina	5	Yes	FACU
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Fraxinus americana	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	105	x 4 =	420
UPL species		x 5 =	
Column Totals:	105 (A)		420 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: u31

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2"								Leaf Litter
0-11	2.5Y 6/6	60	10YR 3/2	40	D	M	SIL	
11-20	2.5Y 5/6	90	10YR 5/8	10	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/16/15
Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-1032
Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Hanover
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-2
Subregion (LRR or MLRA): LRR-R Lat: 42.44888946 Long: -79.13402909 Datum: NAD-83
Soil Map Unit Name: Fremont silt loam NWI classification: upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A583
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-1"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 6032

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus americana	40	Y	FACW
2. Acer saccharum	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fraxinus americana	10	Y	FACW
2. Fagus grandifolia	5	Y	FACU
3. Acer saccharum	5	Y	FACU
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Epilobium ciliatum	30	Y	FACW
2. Symphyotichum vovae-angliae	28	Y	FACW
3. Onoclea sensibilis	6	N	FACW
4. Rosa multiflora	2	N	FACU
5. Rubus idaeus	2	N	FACU
6. Carex flava	2	N	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	70	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 29 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	44	x 2 =	128
FAC species	0	x 3 =	0
FACU species	84	x 4 =	336
UPL species	0	x 5 =	0
Column Totals:	150 (A)		466 (B)

Prevalence Index = B/A = 3.10

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

-species have adapted to living in wet conditions through morphological adaptations – examples include fluted trunks and shallow roots

-species: White Ash, Sugar maple, Beech

SOIL

Sampling Point: 1032

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 2.5/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua Sampling Date: 11/16/13

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-1033

Investigator(s): M. Boberg S Bucklenmeyer Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 42.44841489 Long: -79.13349488 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____ No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches):
Water Table Present?	Yes ____	No ____	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No ____	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: L633

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus americana	40	Y	FACU
2. Fagus grandifolia	20	Y	FACU
3. Populus grandidentata	20	Y	FACU
4. Prunus serotina	10	N	FACU
5. Acer saccharum	10	N	FACU
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	40	Y	FACU
2. Acer saccharum	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Fagus grandifolia	5	Y	FACU
2. Acer saccharum	5	Y	FACU
3. Fraxinus americana	5	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	165	x 4 =	660
UPL species	0	x 5 =	0
Column Totals:	165 (A)		660 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: U33

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	2.5Y 4/3	100					SIL	
9-20	2.5Y 5/4	75	10YR 5/8	20	C	M	SIL	
	2.		2.5Y 4/2	5	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/17/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-034

Investigator(s): M. Boberg R. Perarski Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 42.45109239 Long: -79.13433237 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No	Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present? Yes X No	If yes, optional Wetland Site ID: WL-A584
Wetland Hydrology Present? Yes X No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-1"

Water Table Present? Yes X No ____ Depth (inches): 0-4"

Saturation Present? (Includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-034

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus racemosa	5	Y	FAC
2. Cornus alba	5	Y	FACW
3. Rhamnus cathartica	5	Y	FACU
4.			
5.			
6.			
7.			
	15	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Carex flava	40	Y	OBL
2. Juncus effusus	15	N	OBL
3. Epilobium ciliatum	15	N	FACW
4. Onoclea sensibilis	5	N	FACW
5. Panicum rigidulum	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 634

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 2.5/1	90	10YR 3/8	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/17/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 635

Investigator(s): M. Boberg R. Pekarski Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 42.45122406 Long: -79.13439883 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X Hydric Soil Present? Yes ____ No X Wetland Hydrology Present? Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (Includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 635

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	5	Y	FACU
2. Rubus idaeus	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	35	Y	FACU
2. Schedonorus arundinaceous	20	Y	FACU
3. Phelum pratense	20	Y	FACU
4. Rosa multiflora	20	Y	FACU
5. Carex flava	5	N	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	110 (A)		420 (B)

Prevalence Index = B/A = 3.81

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-035

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 4/3	100					SIL	
10-14	2.5Y 4/2	100					SIL	
14-20	2.5Y 7/2	90	10YR 5/8	5	C	M	SIL	
			2.5Y 4/2	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/17/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-036e

Investigator(s): M. Bobery R. Perarski Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-5

Subregion (LRR or MLRA): LRR-R Lat: 42.452041165 Long: -79.13509953 Datum: NAD 83

Soil Map Unit Name: Busti silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland?	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A585
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-10"
Water Table Present?	Yes X	No ____	Depth (inches): 2"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 636

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	50	Y	FACU
2. Fraxinus americana	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	15	Y	FACU
2. Acer saccharum	5	Y	FACU
3. Fraxinus americana	5	Y	FACU
4.			
5.			
6.			
7.			
	25	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Symphyotichum vovae-angliae	15	Y	FACW
2. Epilobium ciliatum	5	Y	FACW
3. Rubus idaeus	5	N	FACU
4. Euthamia graminifolia	4	N	FAC
5. Thelypteris noveboracenses	2	N	FAC
6. Carex flava	2	N	OBL
7. Onoclea sensibilis	2	N	FACW
8.			
9.			
10.			
11.			
12.			
	35	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 29 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	12	x 2 =	24
FAC species	6	x 3 =	18
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	120 (A)		444 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Trees/Shrub species have adapted to living in wet conditions through morphological adaptations. These species have fluted trunks, and shallow roots.

SOIL

Sampling Point: DP- 036

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	2.5Y 2.5/1	95	10YR 5/8	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/17/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- W37

Investigator(s): M. Bobeg R. Pekarski Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 42.45232509 Long: -79.13504189 Datum: NAD 83

Soil Map Unit Name: Busti silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches):	
Water Table Present?	Yes ____	No ____	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ____	No ____	Depth (inches):	Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 037

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fagus grandifolia	20	Y	FACU
2. Acer Saccharum	10	Y	FACU
3. Prunus Serotina	10	Y	FACU
4. Tsuga canadensis	5	N	FACU
5.			
6.			
7.			
	45	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	10	Y	FACU
2. Acer saccharum	5	Y	FACU
3. Prunus Serotina	5	Y	FACU
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	105	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	105 (A)		260 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 037

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1"								Leaf litter
0-1	10YR 3/3	100					SIL	
1-8	10YR 5/8	90	10YR 3/2	10	D	M	SIL	
8-20	10YR 5/8	60	2.5Y 6/8	20	C	M	SIL	
			2.5Y 7/2	10	C	M	SIL	
			10YR 3/2	10	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/17/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 638

Investigator(s): M Boberg R. Perarski Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR or MLRA): LRR-R Lat: 42.45322102 Long: -79.13486225 Datum: NAD 83

Soil Map Unit Name: Busti silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland?	Yes X No
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A586

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-12"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 038

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix petiolaris	5	Y	FACW
2. Fraxinus americana	5	Y	FACU
3. Acer saccharum	5	Y	FACU
4.			
5.			
6.			
7.			
	15	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Salix petiolaris	15	Y	FACW
2. Cornus alba	15	Y	FACW
3. Cornus racemosa	10	Y	FAC
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Polygonum arifolium	50	Y	OBL
2. Eutrochium graminifolia	20	Y	FAC
3. Eupatorium perfoliatum	15	N	FACW
4. Scirpus cyperinus	5	N	OBL
5. Carex lupulina	5	N	OBL
6. Juncus effusus	5	N	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	65	x 1 =	65
FACW species	~~35~~50	x 2 =	100
FAC species	30	x 3 =	90
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	~~40~~ 155	(A)	295 (B)

Prevalence Index = B/A = 1.90

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-638

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 2.5/1	90	10YR 5/8	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/16/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 039

Investigator(s): M. Bobberg R. Pekarski Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 42.45371903 Long: -79.13493859 Datum: NAD 83

Soil Map Unit Name: Busti silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-639

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina	50	Y	FACU
2. Acer saccharum	20	N	FACU
3. Fagus grandifolia	10	N	FACU
4. populus grandidentata	10	N	FACU
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	15	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	105 (A)		420 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 039

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2"								leaf litter
0-2	10YR 4/4	100					SIL	
2-14	10YR 4/4	95	10YR 5/8	5	C	M	SIL	
14-20	10YR 4/6	90	10YR 4/4	10	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/17/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-640

Investigator(s): M Boberg R Pekarski Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-3

Subregion (LRR or MLRA): LRR-R Lat: 42.45455562 Long: -79.13541263 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland?	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A587
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0--10"
Water Table Present?	Yes X	No ____	Depth (inches): 0"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 040

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	5	Y	FACU
2. Fraxinus americana	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	10	Y	FACW
2. Cornus racemosa	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Epilobium ciliatum	50	Y	FACW
2. Bidens aristosa	10	N	FACW
3. Eupatorium perfoliatum	10	N	FACW
4. Symphyotrichum vorae-angliae	10	N	FACW
5. Euthamia graminifolia	10	N	FAC
6. Scirpus cyperinus	5	N	OBL
7. Onoclea sensibilis	5	N	FACW
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Parthenocissus quinquefolia	1	Y	FACU
2.			
3.			
4.			
	1	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	95	x 2 =	190
FAC species	20	x 3 =	60
FACU species	11	x 4 =	44
UPL species	0	x 5 =	0
Column Totals:	131 (A)		299 (B)

Prevalence Index = B/A = 2.28

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-6(4)D

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 2.5/1	90	10YR 5/8	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/17/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 1041

Investigator(s): M. Osberg R. Pekarski Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 3-5

Subregion (LRR or MLRA): LRR-R Lat: 42.45399529 Long: -79.13526398 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No X Hydric Soil Present? Yes _____ No X Wetland Hydrology Present? Yes _____ No X	Is the Sampled Area within a Wetland? Yes _____ No X If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches):

Water Table Present? Yes _____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-1041

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus americana	40	Y	FACU
2. Acer saccharum	35	Y	FACU
3. Fagus grandifolia	5	N	FACU
4.			
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	5	Y	FACU
2. Acer saccharum	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Acer saccharum	5	Y	FACU
2. Rubus idaeus	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-(24)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1"								leaf litter
0-8"	10YR 4/2	100					SL	
8-20"	10YR 4/6	85	10YR 5/8	5	C	M	SIL	
			10YR 4/2	10	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/19/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 048

Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Forestville

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 42.46256045 Long: -79.14864427 Datum: NAD 83

Soil Map Unit Name: Orpark silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland?	Yes X No
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A391

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0-4"

Water Table Present? Yes X No ____ Depth (inches): 0"-1"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- WM2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Fraxinus americana	10	Y	FACU
2. Cornus alba	10	Y	FACW
3. Cornus racemosa	10	Y	FAC
4.			
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Epilobium ciliatum	40	Y	FACW
2. Euthamia graminifolia	20	Y	FAC
3. Juncus effusus	15	N	OBL
4. Leersia oryzoides	10	N	OBL
5. Polygonum arifolium	10	N	OBL
6. Ranunculus bulbosus	5	N	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-042

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 4/2	60	10YR 5/8	40	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/19/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-049

Investigator(s): M. Bolbrig S. Buckenmeyer Section, Township, Range: Forestville

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR or MLRA): LRR-R Lat: 42.46130332 Long: -79.14892645 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes _____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-1049

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Lonicera tatarica	30	Y	FACU
2. Cornus racemosa	10	Y	FAC
3.			
4.			
5.			
6.			
7.			
	40 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	50	Y	FACU
2. Schedonorus arundinaceous	20	Y	FACU
3. Galium boreale	18	N	FAC
4. Fraxinus americana	5	N	FACU
5. Acer saccharum	5	N	FACU
6. Carex flava	2	N	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	0	x 2 =	0
FAC species	28	x 3 =	84
FACU species	110	x 4 =	440
UPL species	0	x 5 =	0
Column Totals:	140 (A)		526 (B)

Prevalence Index = B/A = 3.75

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-049

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y 4/4	100					SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/19/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 1050

Investigator(s): M. Ebberg S. Buckenmeyer Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 42.457172604 Long: -79.14740587 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland?	Yes X No
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A592

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-2"
Water Table Present?	Yes X	No ____	Depth (inches): 1"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-1050

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus americana	10	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	15	Y	FACW
2. Cornus racemosa	10	Y	FAC
3. Crataegus mollis	10	Y	FAC
4.			
5.			
6.			
7.			
	35	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Scirpus cyperinus	40	Y	OBL
2. Juncus effusus	30	Y	OBL
3. Euthamia graminifolia	20	Y	FACW
4. Eupatorium perfoliatum	10	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	45	x 2 =	90
FAC species	20	x 3 =	60
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	145	(A)	260 (B)

Prevalence Index = B/A = 1.79

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 050

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	2.5y 3/1	85	10YR 5/8	15	C	M	SIC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/19/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 105

Investigator(s): M. Boberg S. Burkenmeyer Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 0-2

Subregion (LRR or MLRA): LRR-R Lat: 42.45829341 Long: -79.14807895 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt Loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes _____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes _____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-051

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Trifolium repens	45	Y	FACU
2. Schedonorus arundinaceous	40	Y	FACU
3. Plantago lanceolata	5	N	FACU
4. Phleum pratense	5	N	FACU
5. Daucus pusillus	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-03/

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5Y 3/2 3/3	95	10YR 6/8	5	C	M	SIC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/20/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-052

Investigator(s): M. Boberg S. Buckenmeyer Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 42.50711476 Long: -79.15555379 Datum: NAD 83

Soil Map Unit Name: Niagara silt loam NWI classification: PFO1/SSIE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland?	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A593
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0-8"
Water Table Present?	Yes X	No ____	Depth (inches): 1"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 652

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	90	Y	FACU
2. Acer saccharinum	10	N	FACW
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharinum	10	Y	FACW
2. Fraxinus americana	10	Y	FACU
3. Linderia benzoin	10	Y	FACW
4.			
5.			
6.			
7.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Dryopteris intermedia	5	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	5	x 3 =	15
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	135 (A)		475 (B)

Prevalence Index = B/A = 3.51

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

X 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

species have adapted to living in wet conditions through morphological adaptations. species had shallow roots and fluted trunks → Eastern Hemlock

SOIL

Sampling Point: DP- 052

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
5"								organic leaf litter
0-8"	2.5Y 4/1	85	10YR 5/8	15	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/20/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 055

Investigator(s): M. Bobeng S Buckenmyer Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%): 0-1

Subregion (LRR or MLRA): LRR-R Lat: 42.50658109 Long: -79.15380229 Datum: NAD 83

Soil Map Unit Name: Canandaigua silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X Hydric Soil Present? Yes ____ No X Wetland Hydrology Present? Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-1053

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	50	Y	FACU
2. Fraxinus americana	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fraxinus americana	5	Y	FACU
2. Acer saccharum	5	Y	FACU
3. Lindera benzoin	5	Y	FACW
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Rosa multiflora	2	Y	FACU
2. Acer saccharum	2	Y	FACU
3. Fagus grandifolia	2	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	0	x 3 =	0
FACU species	86	x 4 =	344
UPL species	0	x 5 =	0
Column Totals:	91	(A)	354 (B)

Prevalence Index = B/A = 3.89

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 053

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2"								leaf litter
0-20"	2.5Y 6/6	90	2.5Y 2.5/1	10	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 11/20/15

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 694

Investigator(s): M. Bobera S. Buckenmeyer Section, Township, Range: Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-2

Subregion (LRR or MLRA): LRR-R Lat: 42.50549219 Long: -79.15257163 Datum: NAD 83

Soil Map Unit Name: Niagara silt loam NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland?	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	WL-A594
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 10"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-054

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	80	Yes	FACU
2. Acer rubrum	10	No	FAC
3. Acer saccharum	5	No	FACU
4. Fraxinus americana	5	No	FACU
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Quercus rubra	10	Yes	FACU
2. Lindera benzoin	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	20	Yes	FACW
2. Symphytrichum vovae-angliae	10	Yes	FACW
3. Euthamia graminifolia	5	No	FAC
4. Quercus rubra	5	No	FACU
5. Lindera benzoin	4	No	FACW
6. Acer rubrum	2	No	FAC
7. Acer saccharum	2	No	FACU
8. Rosa multiflora	2	No	FACU
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 054

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	2.5Y 4/1	85	10YR 5/6	15	C	M	SIC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-659

Investigator(s): B. Yurts N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1-3 %

Subregion (LRR or MLRA): LRR-R Lat: 42.429161 Long: -79.125850 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3-8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A595
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0"-2"

Water Table Present? Yes X No ____ Depth (inches): 8"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-659

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. ~~Salix Sericea~~ Cornus alba	10	Y	FACW
2. Sambucus nigra	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	60	Y	FACW
2. Impatiens Capensis	20	Y	FACW
3. ~~Salix Sericea~~ Cornus alba	10	N	FACW
4. Solidago Rugosa	10	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-659

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-6"	10yR 2/1	100					SIL	
6"-20"	2.5y 5/1	93	7.5yR 5/8	5	C	M	SIL	
			2.5yR 4/6	2	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/19/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-660

Investigator(s): B. Vias N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 3-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.429005 Long: -79.125769 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland datapoint for Wetland A595

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-Uno

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus Serotina	70	Y	FACU
2. Acer saccharum	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Rhamnus Cathartica	10	N	FAC
2. Fagus americana	10	N	FACU
3. Viburnum lantanoides	20	Y	FACU
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Erythronium albidum	30	Y	FACU
2. Prunus Serotina	5	N	FACU
3. Pteridium aquilinum	5	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: Ø (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: Ø (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-6100

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 2.5/1	100					Silt	
4-15	10YR 3/6	100					Silt	
15-20	10YR 5/6	100					Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 661

Investigator(s): B. Viets / N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.399081 Long: -79.103513 Datum: NAD 83

Soil Map Unit Name: Fremont Silt loam 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A596
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

Peripheral Portion of large off ROW. adjacent Wetland Complex.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 12"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 661

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	30	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Alnus serrulata	5	Y	OBL
2. ~~Fagus~~ Fraxinus pennsylvanica	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	30	Y	FACW
2. Solidago gigantea	15	Y	FACW
3. Equisetum palustre	5	N	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 661

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	10yr 2/1	95	5yr 4/6	5	C	m	SIL	
8"-16"	10yr 5/6	90	7.5yr 5/6	10	C	m	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-6062

Investigator(s): Ben Virts, Nicole Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.399033 Long: -79.103600 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam, 15 to 25% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A596

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 0602

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Carpinus Carolinia	25	Y	FAC
2. Acer rubrum	60	Y	FAC
3. Celtis occidentalis	5	N	FAC
4.			
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Celtis occidentalis	5	N	FAC
2. Fraxinus pennsylvanica	7	Y	FACW
3. Carpinus Carolina	15	Y	FAC
4. Fagus grandifolia	2	N	FACU
5.			
6.			
7.			
	29	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Erythronium rostratum	10	—	NI
2. Dryopteris intermedia	5	NO	FAC
3. Dryopteris marginalis	15	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable	Ø		
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x 1 =	—
FACW species	7	x 2 =	14
FAC species	110	x 3 =	330
FACU species	17	x 4 =	68
UPL species	—	x 5 =	—
Column Totals:	134 (A)		412 (B)

Prevalence Index = B/A = 3.07

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes __ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Location has a mix of vegetation, FAC species tend to grow all over area in both upland and wetlands. Area does not meet Rapid Test or Fac-Neutral test. Dominance test was calculated @ 80% but do to false positives prevalence test was also done with an index of just above 3, due to these factors and marginal calculations this are is not considered hydrophytic.

SOIL

Sampling Point: DP-6062

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 3/3	100%					Silt	
2-4	2.5Y 3/3	80%	10YR 5/6	20%	C	M	Silt	
4-20	10YR 5/6	90%	2.5Y 3/3	10%	D	M	Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-663

Investigator(s): Ben Viets, Nicole Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 1-3

Subregion (LRR or MLRA): LRR-R Lat: 42.407826 Long: -79.114228 Datum: NAD 83

Soil Map Unit Name: Fremont Silt loam, 0 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID: WL-A597
Wetland Hydrology Present?	Yes X No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): —

Water Table Present? Yes ____ No X Depth (inches): —

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 4"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-Le63

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	5	Y	FACU
2. Salix bicolor	10	Y	FACW
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Typha latifolia	33	Y	OBL
2. Euthamia graminifolia	25	Y	FAC
3. Impatiens capensis	10	N	FACW
4. Onoclea sensibilis	2	N	FACW
5. Rubus allegheniensis	5	N	FACU
6. Juncus effusus	25	Y	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-1963

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100%					Silt	
4-8	2.5Y 3/2	90%	5YR 3/4	10%	C	PL/M	Silt Loam	
8-20	2.5Y 3/1	95%	5YR 3/4	5%	C	PL/M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/10

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-1064

Investigator(s): Ben Virts, Nicole Quehr Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 42.407738 Long: -79.113954 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam, 0 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for wetland A597

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-6604

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Herb Stratum (Plot size: 5')			
1. Solidago canadensis	32	Y	FACU
2. Solidago rugosa	5	N	FAC
3. Ambrosia artemisiifolia	25	Y	FACU
4. Phalaris arundinacea	25	Y	FACW
5. Asclepias syriaca	2	N	UPL
6. Impatiens capensis	2	N	FACW
7. Galium boreale	2	N	FAC
8. Dactylis glomerata	2	N	FACU
9. Trifolium repens	5	N	FACU
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	27	x 2 =	54
FAC species	7	x 3 =	21
FACU species	64	x 4 =	256
UPL species	2	x 5 =	10
Column Totals:	100 (A)		341 (B)

Prevalence Index = B/A = 3.41

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

0-14 10YR 4/6 100% SiL
14-20 2.5Y 4/2 90% 5YR 3/4 10% C M & SiL

SOIL

Sampling Point: DP-6(04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR 4/6	100					Si	
14-20	2.5Y 4/2	90	5YR 3/4	10	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-68

Investigator(s): B. Viets, N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0%-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.409058 Long: -79.110855 Datum: NAD 83

Soil Map Unit Name: FmB - Fremont Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A598
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-668

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	60	Y	FAC
2. Ulmus americana	25	Y	FACW
3.			
4.			
5.			
6.			
7.			
	85	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer rubrum	10	Y	FAC
2. Ulmus americana	30	Y	FACW
3. Rosa multiflora	5	N	FACU
4.			
5.			
6.			
7.			
	45	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Ulmus americana	15	Y	FACW
2. Rubus allegheniensis	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-668

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-5"	10YR 3/1	85%	5YR 4/3	15%	C	m/PL	SI	
5"-12"	10YR 4/6	95%	7.5YR 4/6	5%	C	m	SI	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** ✓ **No** ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-669

Investigator(s): B. Viers, N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0% - 2%

Subregion (LRR or MLRA): LRR-R Lat: 42.408968 Long: -79.110980 Datum: NAD 83

Soil Map Unit Name: FmB - Fremont Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for wetland A598.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-669

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. ~~Ulmus americana~~ ~~Fraxinus~~	30	Y	~~FACW~~
2. Malus prunifolia	10	Y	UPL
3. Fraxinus pennsylvanica	30	Y	FACW
4.			
5.			
6.			
7.			
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Malus prunifolia	15	Y	UPL
2. ~~Ulmus americana~~ Fraxinus pennsylvanica	10	Y	FACW
3. ~~Multiflora rose~~ Rosa multiflora	10	Y	FACU
4.			
5.			
6.			
7.			
	35	= Total Cover	

Herb Stratum (Plot size: 5')			
1. ~~Ulmus americana~~ Fraxinus pennsylvanica	15	Y	FACW
2. Rubus allegheniensis	25	Y	FACU
3. Onoclea sensibilis	10	N	FACW
4. Prunus serotina	10	N	FACU
5. Fragaria vesca	10	N	UPL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable	Ø		
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43.89 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	Ø	x 1 =	Ø
FACW species	~~50~~ 65	x 2 =	130
FAC species	Ø	x 3 =	Ø
FACU species	45	x 4 =	180
UPL species	35	x 5 =	175
Column Totals:	145 (A)		485 (B)

Prevalence Index = B/A = 3.34

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 669

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-2"	10yR4/3	98	5yR4/6	2	C	m	SIL	
2"-20"	10yR4/4	90	10yR4/2	10	D	m	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-670

Investigator(s): B. Viets, N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 42.409526 Long: -79.110832 Datum: NAD 83

Soil Map Unit Name: FmB - Fremont silt loam, 3 to 8% slopes NWI classification: UPland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: wetland A599

Remarks: (Explain alternative procedures here or in a separate report.)

PFO wetland. data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 670

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	10	Y	FACW
2. Acer rubrum	15	Y	FAC
3. Malus prunifolia	5	N	UPL
4.			
5.			
6.			
7.			
	30	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Lonicera tatarica	15	Y	FACU
2. Rosa multiflora	10	Y	FACU
3. Ulmus americana	10	Y	FACW
4. Malus prunifolia	5	N	UPL
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Cornus amomum	10	Y	FACW
2. Lonicera tatarica	15	Y	FACU
3. Viburnum dentatum	5	N	FAC
4. Solidago rugosa	5	N	FAC
5. Fraxinus pennsylvanica	5	N	FACW
6. Ulmus americana	10	Y	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 62.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 670

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-1"	10yR3/1	90	7.5yR4/4	10	C	PL	SI	
1"-15"	10yR4/2	78	5yR4/6	20	C	PLm	SIL	
			7.5yR5/8	2	C	m		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-671

Investigator(s): B. Viets, N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.409334 Long: -79.110791 Datum: NAD 83

Soil Map Unit Name: FmB - Fremont Silt Loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A599

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 67 (

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Malus prunifolia	40	Y	UPL
2. Acer saccharum	40	Y	FACU
3.			
4.			
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. ~~Malus~~ Lonicera tatarica	30	Y	FACU
2. Fraxinus pennsylvanica	10	Y	FACW
3. Rosa multiflora	10	Y	FACU
4.			
5.			
6.			
7.			
	50	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Fraxinus pennsylvanica	30	Y	FACW
2. Lonicera tatarica	20	Y	FACU
3. Acer saccharum	10	N	FACU
4. Fragaria vesca	10	N	UPL
5. Rubus allegheniensis	10	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.57% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	120	x 4 =	480
UPL species	50	x 5 =	250
Column Totals:	210 (A)		810 (B)

Prevalence Index = B/A = 3.86

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 671

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/3	100?					SiL	
1-16	2.5Y 4/2	90?	7.5YR 4/6	10?	C	M	SiL	
16-20	2.5Y 5/4	90?	10YR 5/8	10?	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-672

Investigator(s): Ben Viets and Nicole Dunbar Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): toe slope Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR or MLRA): LRR-R Lat: 42.406459 Long: -79.119304 Datum: NAD 83

Soil Map Unit Name: Bust. silt loam, 3 to 8% slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A600
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes X	No ____	Depth (inches): 16"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 10"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-672

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 5')			
1. Salix discolor	15	Y	FACW
2. Fragaria vesca	5	N	UPL
3. Galium boreale	20	Y	FAC
4. Equisetum arvense	15	Y	FAC
5. Onoclea sensibilis	10	N	FACW
6. Viburnum dentatum	5	N	FAC
7. Solidago ~~rugosa~~ canadensis	5	N	FACU
8. Ambrosia artemisiifolia	5	N	FACU
9. Muhlenbergia Schreberi	20	Y	FAC
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-672

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 2.5/1	98%	7.5YR 4/6	2%	C	M	Si	
6-16	10YR 4/2	80%	10YR 5/8	15%	C	M	SCL	
			2.5Y 2.5/1	5%	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-1673

Investigator(s): Ben Viets and Nicole Dutzer Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR or MLRA): LRR-R Lat: 42.406287 Long: -79.119349 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland soil pit of wetland A595.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 673

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		

Herb Stratum (Plot size: 5')			
1. Solidago rugosa	35	Y	FAC
2. Taraxacum officinale	2	N	FACU
3. Fragaria vesca	15	N	UPL
4. Muhlenbergia schreberi	30	Y	FAC
5. Ranunculus acris	2	N	FAC
6. Galium boreale	2	N	FAC
7. Ambrosia artemisiifolia	2	N	FACU
8. Chamaecrista fasciculata	2	N	FACU
9. Dactylis glomerata	10	N	FACU
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x 1 =	—
FACW species	—	x 2 =	—
FAC species	69	x 3 =	207
FACU species	16	x 4 =	64
UPL species	15	x 5 =	75
Column Totals:	100 (A)		346 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No __

Remarks: (Include photo numbers here or on a separate sheet.)

Area meets dominance test, but when considering the non-dominants for prevalence test it is not considered hydrophytic vegetation.

SOIL

Sampling Point: DP-673

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/2	100					SiL	
6-16	2.5Y 3/2	95	5YR 4/6	5	C	M	SiL	
16-20	2.5Y 5/4	70	10YR 5/6	10	C	M	SL	
			2.5Y 5/1	20	D	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-674

Investigator(s): Ben Virts and Nicole Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): toe slope Local relief (concave, convex, none): Concave Slope (%): 25-30%

Subregion (LRR or MLRA): LRR-R Lat: 42.406072 Long: -79.119617 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% slopes NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: Wetland A601

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-674

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	15	Y	FACW
2. Salix discolor	55	Y	FACW
3.			
4.			
5.			
6.			
7.			
	70 = Total Cover		
Herb Stratum (Plot size: 30')			
1. Ranaculus acris	5	N	FAC
2. Muhlenbergia schreberi	20	Y	FAC
3. Euthamia graminifolia	20	Y	FAC
4. Galium boreale	6	N	FAC
5. Ambrosia artemisiifolia	5	N	FACU
6. Solidago rugosa	30	Y	FAC
7. Viburnum dentatum	10	N	FAC
8.			
9.			
10.			
11.			
12.			
	96 = Total Cover		
Woody Vine Stratum (Plot size: 5')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-674

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	80	7.5YR 4/6	20	C	PL/M	Si	
6-15	2.5Y 6/3	100	2.5Y 5/6	40	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-675

Investigator(s): B. Viets, N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 20%

Subregion (LRR or MLRA): LRR-R Lat: 42.427949 Long: -79.135108 Datum: NAD 83

Soil Map Unit Name: BsA - Busti silt loam, 0 to 3 percent slope NWI classification: PEMSE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A602

Remarks: (Explain alternative procedures here or in a separate report.)

Wetland is an old and shallow impoundment located within a previously mapped NWI area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 675

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix discolor	10	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	30	Y	FACW
2. Carex flava	10	N	OBL
3. Juncus effusus	5	N	OBL
4. Galium aparine	10	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	55 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	40	x 2 =	80
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	65 (A)		125 (B)

Prevalence Index = B/A = 1.9

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-675

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-13"	10yr 2/1	90	7.5yr 4/6	10	C	PL/M	SI	
13"-16"	10yr 2/1	85	7.5y 4/6	5	C	M	SI	
			10yr 5/8	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 676

Investigator(s): B. Vars N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2%

Subregion (LRR or MLRA): LRR-R Lat: 42.427956 Long: -79.134963 Datum: NAD 83

Soil Map Unit Name: BsA - Busti silt loam, 0 to 3 percent slope NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for wetland A602.
In open field, currently being cultivated for Spruce/pine tree farm.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):	
Water Table Present?	Yes ____	No X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):	**Wetland Hydrology Present?** Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-676

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Picea pungens	20	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Solidago rugosa	15	N	FAC
2. Solidago canadensis	15	N	FACU
3. Fragaria virginiana	5	N	UPL
4. Muhlenbergia schreberi	60	Y	FAC
5. Ambrosia artemisiifolia	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	3	x 1 =	3
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	40	x 4 =	160
UPL species	5	x 5 =	25
Column Totals:	120 (A)		410 (B)

Prevalence Index = B/A = 3.42

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Property owner actively using upland field to grow Sitka spruce (Picea pungens) tree farm.

SOIL

Sampling Point: DP- E760

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/3	100?					SiL	
6-20	2.5Y 4/3	85?	5YR 3/4	5	C	M	SL	
			10YR 4/2	10	D	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Soils do not meet hydric soil indicators.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-077

Investigator(s): Ben Wirts and Nicole Ortner Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 10

Subregion (LRR or MLRA): LRR-R Lat: 42.426381 Long: -79.133742 Datum: NAD 83

Soil Map Unit Name: Busti silt loam, 0 to 3 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A003
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic position indicator met because wetland is located in a depression.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-677

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix discolor	30	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Salix discolor	5	N	FACW
2. Phalaris arundinacea	40	Y	FACW
3. Muhlenbergia Schreberi	30	Y	FAC
4. Solidago gigantea	15	N	FACW
5. Galium boreale	10	N	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	Ø	x 1 =	Ø
FACW species	90	x 2 =	180
FAC species	40	x 3 =	120
FACU species	Ø	x 4 =	Ø
UPL species	Ø	x 5 =	Ø
Column Totals:	130 (A)		300 (B)

Prevalence Index = B/A = 2.31

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 677

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 3/1	95	7.5YR 4/6	5	C	M	SiL	
4-14	10YR 3/1	85	10YR 4/6	5	C	M	SiL	
			5YR 4/6	10	C	M		
14-20	2.5Y 4/3	40	2.5Y 4/1	30	D	M	SiL	
			10YR 5/8	30	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/23

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-678

Investigator(s): B. Virts and N. Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.426420 Long: -79.133754 Datum: NAD 83

Soil Map Unit Name: Busti silt loam, 0 to 3 percent slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? Yes ___ No X

If yes, optional Wetland Site ID: ___

Remarks: (Explain alternative procedures here or in a separate report.)

Upland pit of Wetland A603.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrologic indicators found.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 678

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Muhlenbergia schreberi	65	Y	FAC
2. Ranunculus acris	5	N	FAC
3. Taraxacum officinale	10	N	FACU
4. Ambrosia artemisiifolia	10	N	FACU
5. Trifolium repens	5	N	FACU
6. Plantago lanceolata	5	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	100 (A)		330 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation does not meet hydrologic parameters.

SOIL

Sampling Point: DP- 078

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	2.5Y 3/2	100%					SiL	
14-16	2.5Y 3/2	95	7.5YR 4/6	5	C	M	SiL	
16-20	2.5Y 5/4	85	10YR 3/1	5	D	M	SL	
			7.5YR 4/6	10	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-680

Investigator(s): B. Viets Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.431002 Long: -79.133887 Datum: NAD 83

Soil Map Unit Name: Ashville Silt Loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A605

Remarks: (Explain alternative procedures here or in a separate report.)

Pem portion of Wetland A605

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 10"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 680

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Pucknera aurea	15	Yes	FACW
2. Viola spp	15	Yes	—
3. Juncus effusus	15	Yes	OBL
4. Galium Boreale	15	Yes	FAC
5. Cornus amomum	10	No	FACW
6. Cornus alba	10	No	FACW
7. Onoclea Sensibilis	10	No	FACW
8. Rosa multiflora	5	No	FAC
9. Ranunculus acris	5	No	FAC
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-680

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-14"	2.5Y 2.5/1	90	7.5YR 4/4	10	C	PL/M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-681

Investigator(s): B. Viers Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2-4%

Subregion (LRR or MLRA): LRR-R Lat: 42.430872 Long: -79.133864 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point For Wetland A605.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 68(

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Galium boreale	20	Yes	FAC
2. Muhlenbergia Schreberi	15	Yes	FAC
3. Dactylis glomerata	15	Yes	FACU
4. Ambrosia artemisiifolia	10	No	FACU
5. Plantago lanceolata	10	No	FACU
6. Taraxacum officinale	5	No	FACU
7. Euthamia graminifolia	20	Yes	FAC
8. Solidago Rugosa	5	No	FAC
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-681

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-12"	2.5Y 7.5/1	100%					SIL	
12"-18"	2.5Y 7.5/1	95%	10YR 4/6	5%	C	M	SIL	
18"-20"	2.5Y 4/2	85%	2.5Y 3/1	10%	D	M	SIL	
			10YR 4/6	5%	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-682

Investigator(s): B. Vess Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Toe of slope Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.431112 Long: -79.133883 Datum: NAD 83

Soil Map Unit Name: Ashville Silt Loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: Wetland AB05	

Remarks: (Explain alternative procedures here or in a separate report.)

PSS Data station for wetland AB05,

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes X	No ____	Depth (inches): 5"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 682

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus alba	30	Yes	FACW
2. Cornus amomum	20	Yes	FACW
3. Rosa multiflora	10	No	FAC
4.			
5.			
6.			
7.			
	60 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea Sensibilis	45	Yes	FACW
2. Cornus alba	15	Yes	FACW
3. Viola spp.	15	Yes	—
4. Cornus amomum	10	No	FACW
5. Impatiens capensis	10	No	FACW
6. Ranunculus acris	5	No	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-682

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-14"	2.5Y 2.5/1	90%	7.5YR 4/4	10%	C	PL/M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-683

Investigator(s): B. Viers Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): toe of slope Local relief (concave, convex, none): Concave Slope (%): 0-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.431973 Long: -79.133913 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A606
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PSS Data station for Wetland A606

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 8"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 683

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cocculus amomum	40	Yes	FACW
2. Fraxinus pennsylvanica	5	NO	FACW
3.			
4.			
5.			
6.			
7.			
	45 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	40	Yes	FACW
2. Equisetum palustre	15	Yes	FACW
3. Cornus amomum	15	Yes	FACW
4. Solidago Rugosa	10	NO	FAC
5. Toxicodendron radicans	10	NO	FAC
6. Euthamia graminifolia	10	NO	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-683

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-14"	2.5Y 2.5/1	80%	7.5YR 4/6	10%	C	PL/M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-684

Investigator(s): B. Viers Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.431774 Long: -79.133901 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data point for wetland A606

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 14"

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-684

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus Serotina	35	Yes	FACU
2. Acer Saccharum	20	Yes	FACU
3. Fagus grandifolia	20	Yes	FACU
4.			
5.			
6.			
7.			
	75	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	20	Yes	FACU
2. Acer Saccharum	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Podophyllum peltatum	25	Yes	FACU
2. Erythronium rostratum	10	Yes	FACU
3. Acer rubrum	10	Yes	FAC
4. Acer Saccharum	5	NO	FACU
5. Cornus amomum	5	NO	FACW
6. Fraxinus pennsylvanica	5	NO	FACW
7. Rubus allegheniensis	5	NO	FACU
8.			
9.			
10.			
11.			
12.			
	65	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 12.5 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	10	x 3 =	30
FACU species	160	x 4 =	640
UPL species	0	x 5 =	0
Column Totals:		(A)	690 (B)

Prevalence Index = B/A = 3.83

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 6841

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-4"	10yr 3/3	100%					SIL	
4"-14"	10yr 3/3	90%	10yr 4/6	10%	C	M	SIL	
14"-20"	2.5y 4/3	90	7.5yr 4/6	10%	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-687

Investigator(s): B.Vigs Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): terrace/floodplain Local relief (concave, convex, none): Flat Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 42.433959 Long: -79.130884 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam, 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A608
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

Floodplain wetlands associated with the confluence of two perennial streams (Streams A531 and A532)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No ___	Depth (inches): 6"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-687

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea Sensibilis	45	Yes	FACW
2. Galium boreale	20	Yes	FAC
3. Carex gynandra	15	No	OBL
4. Fraxinus pennsylvanica	10	No	FACW
5. Rosa multiflora	10	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-687

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-12"	2.5y2.5/1	85	2.5y5/1	10	D	M	SL	
			10yr 4/2	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 686

Investigator(s): B. Vinis Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.433860 Long: -79.130922 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A608

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 688

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga Canadensis	55	Yes	FACU
2. Betula alleghaniensis	20	Yes	FAC
3. Acer Saccharum	15	No	FACU
4.			
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Ostrya Virginiana	20	Yes	FACU
2. Tsuga Canadensis	10	Yes	FACU
3. Acer Saccharum	5	No	FACU
4.			
5.			
6.			
7.			
	35	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Erythronium rostratum	20	Yes	UPL
2. Tsuga Canadensis	10	Yes	FACU
3. Acer negundo	10	Yes	FAC
4. Polystichum acrostichoides	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	45	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 28.6% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	120	x 4 =	480
UPL species	20	x 5 =	100
Column Totals:	170 (A)		670 (B)

Prevalence Index = B/A = 3.94

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 688

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-10"	2.5Y 3/3	100					SL	
10"-20"	2.5Y 4/4	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-689

Investigator(s): B. Viers Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.434515 Long: -79.130629 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt loam 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A609
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

Hemlock Depressional Wetland

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 2"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 68G

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga Canadensis	40	Yes	FACU
2. Fraxinus Pennsylvanica	5	NO	FACW
3.			
4.			
5.			
6.			
7.			
	45	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Ulmus americana	20	Yes	FACW
2. Tsuga Canadensis	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Impatiens Capensis	20	Yes	FACW
2. Onoclea Sensibilis	10	Yes	FACW
3. Ulmus americana	5	NO	FACW
4. Arisaerra triphyllum	5	NO	FAC
5. Osmunda Cinnamonea	5	NO	FACW
6. Thelypteris palustris	5	NO	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Hemlock Dominated PFO

SOIL

Sampling Point: DP- 689

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-12"	Mucky Peat							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 690

Investigator(s): B. Viris Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope/Floodplain Local relief (concave, convex, none): Convex/Flat Slope (%): 0% - 1%

Subregion (LRR or MLRA): LRR-R Lat: 42.434393 Long: -79.130735 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Station for Wetland A609

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 690

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	95	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	95	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Tsuga canadensis	10	Yes	FACU
2. Fagus grandifolia	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Fagus grandifolia	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	5	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	120	x 4 =	480
UPL species	0	x 5 =	0
Column Totals:	120 (A)		480 (B)

Prevalence Index = B/A = 4.80

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 690

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
4 inches of organic Leaf/needle l. Hor Present							S	
0"-8"	10yR 3/4	100					SI	
8"-20"	10yR 4/3	95	2.5y5/4	5%	C	M	SI	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-691

Investigator(s): B. Virts Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): <0%

Subregion (LRR or MLRA): LRR-R Lat: 42.434892 Long: -79.131436 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland B610
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

Isolated Pem Wetland near/within an open field area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 12"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-691

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea Sensibilis	30	Yes	FACW
2. Carex Flava	20	Yes	OBL
3. Impatiens capensis	15	No	FACW
4. Enthamia grandifolia	15	No	FAC
5. Solidago rugosa	10	No	FAC
6. Juncus effusus	10	No	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DP-611

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-9"	2.5Y 3/2	95	10YR 5/6	5	C	M	SIL	
9"-16"	10YR 5/2	80%	10YR 4/1	10	D	M	SIL	
			7.5YR 4/6	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/24/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-692

Investigator(s): B. Viris Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.434810 Long: -79.131451 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt loam 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A610 – This upland Data Point was collected immediately downgradient of the Wetland Boundary to demonstrate a lack of jurisdictional Connection to another Feature

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-692

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula alleghaniensis	30	Yes	FAC
2. Acer saccharum	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Alnus Serrulata	15	Yes	OBL
2. Prunus Serotina	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	25	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Alnus Serrulata	5	Yes	OBL
2. Eutrochia grandifolia	5	Yes	FAC
3. Arisaema triphyllum	5	Yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-692

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-6"	2.5Y 3/2	100					SIL	
6"-20"	10YR 4/6	95	2.5Y 3/2	5	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-693

Investigator(s): B. Viris Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave/Flat Slope (%): 0-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.446028 Long: -79.134286 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam, 3 to 8% Slopes NWI classification: UPland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A611
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PFO wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 693

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus Americana	25	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	25 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Ulmus americana	35	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	35 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Ulmus americana	10	Yes	FACW
2. Cornus amomum	5	Yes	FACW
3. Fraxinus Pennsylvanica	5	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Trees present exhibit morphological adaptations - Shallow Root systems and fluting at base

SOIL

Sampling Point: DP- 693

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9"	10yr 3/2	85%	7.5yr 3/4	15%	C	m	CL	
9"-15"	10yr 5/1	70%	10yr 4/1	20%	D	m	CL	
			7.5yr 5/8	10%	C	m		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-694

Investigator(s): B. Viets Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1%

Subregion (LRR or MLRA): LRR-R Lat: 42.440039 Long: -79.134337 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present? Yes ____ No X	
Wetland Hydrology Present? Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data point for wetland A611.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-BAM

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina	10	Yes	FACU
2. Acer saccharum	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	25	Yes	FAC
2. Cornus amomum	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	35	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Rosa multiflora	30	Yes	FAC
2. Arisaema triphyllum	15	Yes	FAC
3. Cornus amomum	5	NO	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	70	x 3 =	210
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	115	(A)	360 (B)

Prevalence Index = B/A = 3.13

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-694

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-16"	10YR 3/3	100%					SIL	
16"-20"	7.5Y 5/3	90	10YR 6/8	5			SIL	
			7.5YR 3/4	5				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-695

Investigator(s): B. Viets Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-10%

Subregion (LRR or MLRA): LRR-R Lat: 42.438854 Long: -79.134610 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam, Rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A613

Remarks: (Explain alternative procedures here or in a separate report.)

Isolated Pem in a forest.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 10"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 69S

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Fraxinus Pennsylvanica	5	Yes	FACW
2. Lonicera tartarica	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Toxicodendron Radicans	25	Yes	FAC
2. Fraxinus pennsylvanica	10	Yes	FACW
3. Rosa multiflora	10	Yes	FAC
4. Lonicera tartarica	10	Yes	FAC
5. Acisaerra triphyllum	5	NO	FAC
6. Onoclea Sensibilis	5	NO	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-695

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-5"	7.5Y 3/2	95	10YR 3/6	5%	C	M	SEL	
5"-16"	2.5Y 3/2	85	10YR 4/6	10%	C	M	SEL	
			5YR 3/4	5%	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 696

Investigator(s): B. VIRTS Section, Township, Range: Town of Harmony

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.439003 Long: -79.134651 Datum: NAD 83

Soil Map Unit Name: Various Silt loam, Rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland AB13.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 696

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	10	NO	FACW
2. Acer Saccharum	50	Yes	FACU
3. Ulmus americana	5	NO	FACW
4. Malus Pumifolia	5	NO	UPL
5.			
6.			
7.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	20	Yes	FAC
2. Lonicera tartarica	10	Yes	FAC
3. Fraxinus Pennsylvanica	5	NO	FACW
4.			
5.			
6.			
7.			
	35	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Toxicodendron radicans	25	Yes	FAC
2. Fraxinus Pennsylvanica	10	Yes	FACW
3. Fragaria virginiana	5	NO	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 696

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-13"	10yR 3/3	100					SL	
13"-20"	10yR 3/3	95	10yR 4/6	5	C	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 697

Investigator(s): B. Virts Section, Township, Range: Town of Harmony

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.437581 Long: -79.134121 Datum: NAD 83

Soil Map Unit Name: Volusia gravelly Silt loam, 8 to 15% slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland BG14

Remarks: (Explain alternative procedures here or in a separate report.)

PFO wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 8"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 697

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americana	30	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Ulmus americana	20	Yes	FACW
2. Fraxinus pennsylvanica	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Fraxinus pennsylvanica	25	Yes	FACW
2. Eutrochium graminifolium	10	Yes	FAC
3. Carex gynandra	5	NO	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 697

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-7"	2.5Y 3/2	95	5YR 4/6	5	C	M	SIL	
7"-15"	2.5Y 3/2	85	2.5/1	10	D	M	SIL	
			7.5YR 5/8	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 698

Investigator(s): B. Vitis Section, Township, Range: Town of Harcover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 3-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.437581 Long: -79.134121 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes _____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data point for wetland AB14.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes _____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-698

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer Saccharum	70	Yes	FACU
2. Malus Prunifolia	10	NO	UPL
3.			
4.			
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer Saccharum	20	Yes	FACU
2. Fagus grandifolia	10	Yes	FACU
3. Acer platanoides	10	Yes	UPL
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Fraxinus pennsylvanica	25	Yes	FACW
2. Acer Saccharum	20	Yes	FACU
3. Fagus grandifolia	10	NO	FACU
4. Euthamia graminifolia	5	NO	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 16.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	5	x 3 =	15
FACU species	130	x 4 =	520
UPL species	20	x 5 =	100
Column Totals:	180 (A)		685 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 698

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0"-8"	10yr3/4	100					SL	
8"-20"	2.5y 5/6	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-699

Investigator(s): B. Viets Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1-2 %

Subregion (LRR or MLRA): LRR-R Lat: 42.437031 Long: -79.133622 Datum: NAD 83

Soil Map Unit Name: Valois gravelly Silt Loam, Rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A615

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 6"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 699

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Oxalis Sensibilis	65	yes	FACU
2. Euthamia graminifolia	10	NO	FAC
3. Carex Flava	5	NO	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 699

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-16"	2.5Y 3/1	90	5YR 4/6	10	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-700

Investigator(s): B. VIRTS Section, Township, Range: Town of Harmony

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.436951 Long: -79.133425 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam, Rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for wetland A615.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 700

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus Serotina	55	Yes	FACU
2. Acer Saccharum	45	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer platanoides	20	Yes	UPL
2. Fagus grandifolia	15	Yes	FACU
3. Acer Saccharum	15	Yes	FACU
4.			
5.			
6.			
7.			
	50	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Fraxinus Americana	10	Yes	FACU
2. Acer platanoides	10	Yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	140	x 4 =	560
UPL species	30	x 5 =	150
Column Totals:	170 (A)		710 (B)

Prevalence Index = B/A = 4,17

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 700

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-15"	10yr 3/4	100					SI	
15"-20"	7.5yr 4/6	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-701

Investigator(s): B. Viets Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR or MLRA): LRR-R Lat: 42.435955 Long: -79.132330 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam, Rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes Y No	**Is the Sampled Area within a Wetland?**	**Yes** Y **No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland P616
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

Organic soil (muck) wetland (PEM).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 2"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-201

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Onoclea Sensibilis	55	Yes	FACW
2. Impatiens Capensis	40	Yes	FACW
3. Thelypteris palustris	5	NO	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-701

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20+	2.5Y2.5/1	100						Muck-Organic Soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- X Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-702

Investigator(s): B.V.RTS Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 2-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.435847 Long: -79.132347 Datum: NAD 83

Soil Map Unit Name: Valois gravelly silt loam, Rolling NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for wetland A616

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 702

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	100	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	100 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	10	Yes	FACU
2. Tsuga Canadensis	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		

Herb Stratum (Plot size: 5')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	120	x 4 =	480
UPL species	0	x 5 =	0
Column Totals:	120 (A)		480 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-302

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2"	of organic leaf/needle litter							
0"-2"	10yR3/4	100					SL	
2"-20"	2.5y5/6	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/25/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-703

Investigator(s): B. Viets Section, Township, Range: Town of Harover

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.437636 Long: -79.132818 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A615
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PSS Data Point for wetland A615

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 8"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 2"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 703

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus amomum	30	Yes	FACW
2. Cornus alba	10	Yes	FACW
3. Rubus allegheniensis	10	Yes	FACU
4.			
5.			
6.			
7.			
	50 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Cornus amomum	55	Yes	FACW
2. Alnus serrulata	15	no	OBL
3. Onoclea sensibilis	10	no	FACW
4. Solidago rugosa	10	no	FAC
5. Rubus allegheniensis	10	no	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-763

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-12"	7.5Y 3/1	95	5YR 4/6	5	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-704

Investigator(s): B. Virts, S. Buckenmeyer Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 20%

Subregion (LRR or MLRA): LRR-R Lat: 42.447164 Long: -79.102326 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt loam, 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A618

Remarks: (Explain alternative procedures here or in a separate report.)

PFO Data Point for Isolated wetland System

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 16"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 7dy

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer Saccharum	30	Yes	FACU
2. Ulmus americana	5	No	FACW
3.			
4.			
5.			
6.			
7.			
	35	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer Saccharum	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Glyceria acutiflora	20	Yes	OBL
2. Carex flava	10	Yes	OBL
3. Juncus effusus	5	No	OBL
4. Oradea sensibilis	5	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	10	x 2 =	20
FAC species	—	x 3 =	—
FACU species	40	x 4 =	160
UPL species	—	x 5 =	—
Column Totals:	85 (A)		215 (B)

Prevalence Index = B/A = 2.53

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Trees are primarily limited to growth on microtopographic highs.

SOIL

Sampling Point: DP-Toi(

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2" leaf litter								
0"-2"	10yr 2/1	100%					SIL	
2"-7"	10yr 3/1	85%	10yr 6/2	15%	D	m	SIC	
7"-18"	10yr 6/2	90%	10yr 6/6	10%	C	m	SIC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-705

Investigator(s): B. Viats S. Buchwinger Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.447097 Long: -79.102548 Datum: NAD 83

Soil Map Unit Name: Chautauqua Si. Ll loam 0 to 5% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland AG18

Remarks: (Explain alternative procedures here or in a separate report.)

PEM Data Station for Wetland AG18.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No ___	Depth (inches): 15"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-705

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Carex Flava	65	Yes	OBL
2. Scirpus cyperinus	10	no	OBL
3. Thelypteris palustris	10	no	FACW
4. Typha latifolia	5	no	OBL
5. Juncus effusus	5	no	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-705

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1 inch	Leaf litter							
0"-2"	mucky Peat		Layer					
2"-10"	2.5Y2.5/1	80%	10yr 3/2	20%	D	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- X Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-706

Investigator(s): B. Vinas, S. Buckmaster Section, Township, Range: Town of Harmony

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Flat Slope (%): 0-1 %

Subregion (LRR or MLRA): LRR-R Lat: 42.447430 Long: -79.102147 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam, 0 to 5% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for wetland A618.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators met.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 706

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	95	Yes	FACU
2. Acer Saccharum	5	NO	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Tsuga canadensis	10	Yes	FACU
2. Acer Saccharum	5	Yes	FACU
3. Fagus grandifolia	5	Yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	120	x 4 =	480
UPL species	0	x 5 =	0
Column Totals:	120 (A)		480 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

No hydrophytic vegetation

SOIL

Sampling Point: DP- 706

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-15"	10yr 4/6	100					SL	
15"-17"	10yr 5/8	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

Auger Refusal @ 17"

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-708

Investigator(s): B. Virts S. Buckenmeyer Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR or MLRA): LRR-R Lat: 42.451988 Long: -79.103368 Datum: NAD 83

Soil Map Unit Name: Chenango gravelly loam, 8to15%slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A619

Remarks: (Explain alternative procedures here or in a separate report.)

Hillside gw seep discharge wetland PEM

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 5"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 708

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Equisetum palustre	40	Yes	FACW
2. Onoclea Sensibilis	25	Yes	FACW
3. Carex gynandra	10	NO	OBL
4. Mentha x piperita	10	NO	OBL
5. Ranunculus acris	5	NO	FAC
6. Eupatorium perfoliatum	5	NO	FACW
7. Parkera aurea	5	NO	FACW
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DP-708

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-4"	mucky Peat							
4"-8"	2.5Y 3/1	98	10YR 6/4	2	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- X Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 709

Investigator(s): B. Viers, S. Buchemeyer Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 5%

Subregion (LRR or MLRA): LRR-R Lat: 42.452071 Long: -79.103683 Datum: NAD 83

Soil Map Unit Name: Chenango gravelly loam 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland AB19.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches):
Water Table Present?	Yes _____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators found/observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 709

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Malus Pumifolia	5	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	15	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Euthamia graminifolia	40	Yes	FAC
2. Solidago canadensis	15	Yes	FACU
3. Ipomoea carica	15	Yes	FACU
4. Ranunculus acris	10	NO	FAC
5. Galium boreale	10	NO	FAC
6. Alliaria petiolata	5	NO	FACU
7. Fragaria Virginiana	5	NO	FAC
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	35	x 4 =	140
UPL species	5	x 5 =	25
Column Totals:	120 (A)		405 (B)

Prevalence Index = B/A = 3.37

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DP- 709

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20"	10yr 3/6	100					SI	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

Not a hydric soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-710

Investigator(s): B. Virts S. Biekenmeyer Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.453394 Long: -79.104779 Datum: NAD 83

Soil Map Unit Name: Collamer silt loam, 8 to 15% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A620

Remarks: (Explain alternative procedures here or in a separate report.)

Pem wetland forms from the outfall from an agricultural pond.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches):
Water Table Present?	Yes X	No ____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 710

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	35	Yes	FACW
2. Equisetum palustre	20	Yes	FACW
3. Impatiens capensis	10	NO	FACW
4. Typha latifolia	10	NO	OBL
5. Carex gynandra	10	NO	OBL
6. Solidago rugosa	5	NO	FAC
7. Rubus allegheniensis	5	NO	FACU
8. Ranunculus acris	5	NO	FAC
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-710

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	2.5Y 3/1	90	10YR 5/8	10%	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-71

Investigator(s): B. Virts, S. Buckenmeyer Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2-4%

Subregion (LRR or MLRA): LRR-R Lat: 42.453421 Long: -79.104889 Datum: NAD 83

Soil Map Unit Name: Cullamer Silt loam, 8 to 15% slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A620.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 711

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Eutrochium graminifolia	55	Yes	FAC
2. Galium boreale	15	No	FAC
3. Equisetum palustre	10	No	FACW
4. Trifolium repens	10	No	FACU
5. Ranunculus acris	5	No	FAC
6. Rosa multiflora	5	No	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-71

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-15"	10YR4/3	98	10YR5/6	2%	C	M	SI	
15"-20"	10YR6/6	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/26/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-714

Investigator(s): B. Virts, S. Buckenmeyer Section, Township, Range: Town of Honeoye

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.457291 Long: -79.105223 Datum: NAD 83

Soil Map Unit Name: Fremont Silt loam 3to8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes +	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A621

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 8"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-714

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Onoclea Sensibilis	30	Yes	FACW
2. Mentha X piperita	25	Yes	OBL
3. Juncus effusus	10	No	OBL
4. Euthamia graminifolia	10	No	FAC
5. Eupatorium perfoliatum	10	No	FACW
6. Carex Flava	5	No	OBL
7. Cornus amomum	5	No	FACW
8. Lythrum Salicaria	5	No	OBL
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 714

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-2"	2.5Y3/2	100%					SIL	
2"-8"	2.5Y3/1	85%	10YR5/8	15%	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/20/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-715

Investigator(s): B. Viets S. Buckenmeyer Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 3-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.457223 Long: -79.105082 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data point for wetland AT621

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 715

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Muhlenbergia Schreberi	65	Yes	FAC
2. Euthamia graminifolia	15	No	FAC
3. Solidago canadensis	10	No	FACU
4. Juncus effusus	5	No	OBL
5. Ranunculus acris	5	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 715

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-13"	10YR 3/3	95	10YR 5/8	5%	C	M	SIL	Rock / Auger @ 13"; Refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-716

Investigator(s): B. Viets, N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2%

Subregion (LRR or MLRA): LRR-R Lat: 42.439011 Long: -79.132082 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A617

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 9"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-716

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	20	Y	FACU
2. Cornus alba	10	Y	FACW
3. Alnus incana	10	Y	FACW
4.			
5.			
6.			
7.			
	40 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	45	Y	FACW
2. Solidago rugosa	25	Y	FAC
3. Carex aurea riva	5	N	OBL
4. Cornus alba	10	N	FACW
5. Eupatorium perfoliatum	5	N	FACW
6. Galium boreale	5	N	FAC
7. Carex flava	5	N	OBL
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-716

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-5"	10yr 3/1	95	10yr 5/8	5	C	M	CL	
5"-20"	10yr 5/1	90	10yr 5/8	10	C	M	CL	mixed w/ gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-717

Investigator(s): B. Virts, N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.439287 Long: -79.132492 Datum: NAD 83

Soil Map Unit Name: Chautauqua silt loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for wetland A617

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-717

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus Serotina	80	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	80 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Prunus Serotina	30	Y	FACU
2. Fagus grandifolia	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
	40 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Fraxinus Americana	40	Y	FAC
2. Fragaria virginiana	10	N	UPL
3. Acer saccharum	15	Y	FACU
4. Tsuga Canadensis	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70 = Total Cover		

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x 1 =	—
FACW species	—	x 2 =	—
FAC species	—	x 3 =	—
FACU species	180	x 4 =	720
UPL species	10	x 5 =	50
Column Totals:	190 (A)		770 (B)

Prevalence Index = B/A = 4.05

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-717

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0'-5"	10yr4/6	100%					SIL	
5"-19"	10yr5/6	100%					SIL	mixed w/ gravel
19"+	Rock Refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** _ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-718

Investigator(s): B. Virts, N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.439941 Long: -79.132081 Datum: NAD 83

Soil Map Unit Name: Busti Silt loam 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present? Yes X No	
Wetland Hydrology Present? Yes X No	If yes, optional Wetland Site ID: Wetland A622

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes X No ____ Depth (inches): 11"

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 9"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-718

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americana	30	Y	FACW
2. Fraxinus pennsylvanica	20	Y	FACW
3. Populus tremuloides	5	N	FACU
4.			
5.			
6.			
7.			
	55	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Ulmus americana	20	Y	FACW
2. Cornus amomum	40	Y	FACW
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	25	Y	FACW
2. Fraxinus pennsylvanica	10	N	FACW
3. Cornus amomum	15	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-718

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-4"	10yr3/1	95	5yr4/6	5	C	M	CL	
4"-13"	10yr5/4	95	10yr5/8	5	C	M	CL	
13"+	Rock Refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-721

Investigator(s): B. Virts, N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.439575 Long: -79.130044 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A624

Remarks: (Explain alternative procedures here or in a separate report.)

Perm Data point for wetland A624.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 721

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Ranunculus acris	2	N	FAC
2. Onoclea sensibilis	38	Y	FACW
3. Phalaris arundinacea	10	N	FACW
4. Cornus amomum	15	N	FACW
5. Carex flava	20	Y	OBL
6. Alnus serrulata	10	N	OBL
7. Scirpus cyperinus	5	N	OBL
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DP-721

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	10YR 3/1	95	7.5YR4/6	5	C	m	CL	
9"-17"	2.5Y 5/3	80	2.5Y5/6	10	C	m	SCL	
			10YR4/1	10	D	m		
17"-20"	10YR5/6	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 722

Investigator(s): B. Virts, N. Dutcher Section, Township, Range: Town of Pomfret

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.439790 Long: -79.130049 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A624
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

PSS Data Point for Wetland A624

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 722

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus amomum	40	Yes	FACW
2. Ulmus Americana	15	NO	FACW
3. Populus tremuloides	5	NO	FACW
4. Fraxinus pennsylvanica	5	NO	FACW
5.			
6.			
7.			
	65	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Equisetum palustre	40	Yes	FACW
2. Onoclea Sensibilis	20	Yes	FACW
3. Cornus amomum	15	NO	FACW
4. Impatiens capensis	10	NO	FACW
5. Eutrochium gravinifolia	5	NO	FAC
6. Fraxinus pennsylvanica	5	NO	FACW
7. Ranunculus acris	5	NO	FAC
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-722

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-4"	10yr3/1	95	7.5yr4/6	5	C	M	CL	
4"-12"	10yr4/1	90	5yr3/4	5	C	M	CL	
			7.5yr5/6	5	C	M		
12"-20"	2.5y5/1	60	10yr5/6	25	C	M	CL	small gravel component
			2.5y3/1	15	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-723

Investigator(s): B. Viess, N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.439724 Long: -79.129271 Datum: NAD 83

Soil Map Unit Name: Busti silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for wetland A624.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-723

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina	70	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Fraxinus americana	20	Y	FACU
2. Prunus serotina	25	Y	FACU
3.			
4.			
5.			
6.			
7.			
	45	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Rubus pensilvanicus	25	Y	FACU
2. Fraxinus americana	10	N	FACU
3. Prunus serotina	20	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	55	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

No hydrophytic vegetation – all species are FACU.

SOIL

Sampling Point: DP-723

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	10yR 4/4	100%					SI	
8"+	Auger Refusal							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-724

Investigator(s): B. Viats, N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.440930 Long: -79.114057 Datum: NAD 83

Soil Map Unit Name: Busti silt loam 0 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes** X **No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland B625
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland in depression.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? **Yes** X **No** ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 724

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	25	Y	FACW
2. Carex flava	10	N	OBL
3. Glyceria acutiflora	25	Y	OBL
4. Fraxinus pennsylvanica	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 724

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0"-2"	10YR 2/1	100%					SCL	organics within profile
2"-12"	2.5Y 6/1	85%	2.5Y 6/6	15%			C	
13"+	Auger Refusal within Clay confining layer							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: CLAY

Depth (inches): 2"

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-725

Investigator(s): B. Viros, N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 2-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.440859 Long: -79.113766 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 0 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data point for Wetland AG25

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators met/observed.

VEGETATION – Use scientific names of plants. Sampling Point: DP-725

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga Canadensis	65	Y	FACU
2. Acer saccharum	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
	95	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	15	Y	FACU
2. Tsuga Canadensis	5	N	FACU
3. Acer saccharum	10	Y	FACU
4.			
5.			
6.			
7.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Prunus serotina	5	N	FACU
2. Rubus pensilvanicus	5	N	FACU
3. Fagus grandifolia	15	Y	FACU
4. Acer saccharum	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is not hydrophytic, all species are FACU.

SOIL

Sampling Point: DP-725

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-2"	10yR 2/1	100					SIL	
2"-7"	5yR 4/6	100					SIL	
7"-14"	10yR 4/6	100					SCL	
14"-18"	10yR 4/6	100					SCL	mixed with gravel
Rock Refusal @ 18"								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Rock refusal layer for auger starting at 18" but does not act as a restrictive layer for water penetration.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 726

Investigator(s): B. Viets, N. Dutcher Section, Township, Range: town of Hanover

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 20%

Subregion (LRR or MLRA): LRR-R Lat: 42.440513 Long: -79.111659 Datum: NAD 83

Soil Map Unit Name: CkB-Chautauqua Silt loam, 3-8% slopes NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: Wetland A626

Remarks: (Explain alternative procedures here or in a separate report.)

Isolated PEM in a Forest.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP- 726

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Carex gynandra	20	Y	OBL
2. Onoclea sensibilis	10	N	FACW
3. Juncus effusus	10	N	OBL
4. Fraxinus pennsylvanica	5	N	FACW
5. Glyceria acutiflora	15	Y	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is hydric, meeting both the Fac-Neutral test and Rapid test.

SOIL

Sampling Point: DP- 726

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-2"	10yr2/1	95%	5yr4/6	5%	C	m	SCL	
2"-11"	7.5yr6/3	60%	10yr5/8	40%	C	m	SCL	
11"-16"	7.5yr6/3	60%	10yr5/8	40%	C	m	SCL	with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 727

Investigator(s): B. Viers, N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 0-10%

Subregion (LRR or MLRA): LRR-R Lat: 42.440486 Long: -79.111822 Datum: NAD 83

Soil Map Unit Name: CkB - Chautauqua Silt loam, 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A626.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators found.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-727

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus Serotina	60	Y	FACU
2. Acer Saccharum	40	Y	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Prunus Serotina	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Acer pensylvanicum	5	Y	FACU
2. Rubus pensilvanicus	5	Y	FACU
3. Acer saccharum	5	Y	FACU
4. Prunus Serotina	5	Y	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

No hydro vegetation observed, all species have an indicator of FACU.

SOIL

Sampling Point: DP-727

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-2"	10yr3/2	100					SIL	
2"-9"	10yr4/6	100					SIL	
9"-20"	10yr5/6	100					SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Not a hydric soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-728

Investigator(s): B. Vitz, N. Drotcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Toe of Slope Local relief (concave, convex, none): Concave Slope (%): 0-1%

Subregion (LRR or MLRA): LRR-R Lat: 42.441409 Long: -79.110929 Datum: NAD 83

Soil Map Unit Name: Valois gravelly s. l. loam, Rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil ND, or Hydrology ND significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ND, Soil ND, or Hydrology ND naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A627
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PFO wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes X	No ___	Depth (inches): 4"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 728

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula alleghaniensis	60%	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	60 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Betula alleghaniensis	20	Yes	FAC
2. Tsuga Canadensis	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Osmunda cinnamomea	70	Yes	FACW
2. Onoclea Sensibilis	10	NO	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Trees are rooted on microtopographic highs.

SOIL

Sampling Point: DP-728

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	Peat							
8"-20"	10yr2/1 mucky Peat							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 5/27/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-729

Investigator(s): B. Virts, N. Dutcher Section, Township, Range: Town of Hamburg

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.441247 Long: -79.111394 Datum: NAD 83

Soil Map Unit Name: Volusia gravelly silt loam, Rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A627

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydro indicators observed.

VEGETATION – Use scientific names of plants. Sampling Point: DP-726

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. TSuga canadensis	50	Yes	FACU
2. Acer Saccharum	30	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Fagus grandifolia	20	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Parathelypteris noveboracensis	15	Yes	FAC
2. Fagus grandifolia	10	Yes	FACU
3. Acer Saccharum	5	No	FACU
4. Acer platanoides	5	No	UPL
5. Rubus allegheniensis	5	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. NOT Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	120	x 4 =	480
UPL species	5	x 5 =	25
Column Totals:	140 (A)		550 (B)

Prevalence Index = B/A = 3.93

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-729

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-20"	7.5YR4/1	100					SIL	
7"-20"	10YR-5/6	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Not a hydric soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/6/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-730

Investigator(s): B. Viess / N. Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Depression/Drainageway Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.143905 Long: -79.128139 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A628
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

Linear PEM wetland within a pasture field

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Geomorphic positioning used because area is in a low / linear area between two upland fields.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-730

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Juncus effusus	30	Y	OBL
2. Carex lupulina	55	Y	OBL
3. Carex flava	10	N	OBL
4. Eupatorium perfoliatum	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation meets both Rapid Test and Fac Neutral test.

SOIL

Sampling Point: DP- 730

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-9"	10yr 2/1	95	2.5y 6/1	5	D	M	SIL	
9"-14"	2.5y 6/1	100					SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/6/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-731

Investigator(s): Ben Viets and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 0-2

Subregion (LRR or MLRA): LRR-R Lat: 42.443984 Long: -79.128262 Datum: NAD 83

Soil Map Unit Name: Chautauqua Silt Loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point to Wetland A628.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed, none to be expected in open field that is flat.

VEGETATION – Use scientific names of plants. Sampling Point: DP-731

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' R)			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Herb Stratum (Plot size: 5' R)			
1. Ranunculus acris	10	N	FAC
2. Dactylis glomerata	34	Y	FACU
3. Trifolium repens	5	N	FACU
4. Daucus Carota	2	N	UPL
5. Trifolium medium	5	N	UPL
6. Plantago lanceolata	5	N	FACU
7. Arctium minus	5	N	FACU
8. Muhlenbergia Schreberia	34	Y	FAC
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x 1 =	—
FACW species	—	x 2 =	—
FAC species	44	x 3 =	132
FACU species	49	x 4 =	196
UPL species	7	x 5 =	35
Column Totals:	100 (A)		363 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-731

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5Y 3/3	100					SiL	
12-14	2.5Y 3/2	95	10YR 5/6	5	C	M	SiL	
14-20	2.5Y 4/4	85	2.5Y 5/1	5	D	M	SiL	
			5YR 3/3	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Not a hydric soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/6/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-732

Investigator(s): Ben Viets and Nicole Quther Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.449316 Long: -79.132284 Datum: NAD 83

Soil Map Unit Name: Fremont silt loams, 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID: Wetland A629

Remarks: (Explain alternative procedures here or in a separate report.)

Large PFO wetland along transitional edge between field and upland forest.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches):
Water Table Present?	Yes ___ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water Stained Leaves were found throughout the wetland. Drainage patterns run through the center of the wetland. Evidence of Algal mat/crust in eastern edge of wetland not where data point was taken.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-732

Tree Stratum (Plot size: 15'R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	50	Y	FACW
2. Acer rubrum	30	Y	FAC
3.			
4.			
5.			
6.			
7.			
	80	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15'R)			
1. Ostrya virginiana	40	Y	FACU
2. Fraxinus pennsylvanica	20	Y	FACW
3. Acer rubrum	10	N	FAC
4. Lonicera japonica	2	N	FACU
5.			
6.			
7.			
	72	= Total Cover	

Herb Stratum (Plot size: 5'R)			
1. Onoclea sensibilis	30	Y	FACW
2. Toxicodendron radicans	15	Y	FAC
3. Symphyotrichum prenanthoides	2	N	FAC
4. Equisetum palustre	2	N	FACW
5. Podophyllum pelatum	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	54	= Total Cover	

Woody Vine Stratum (Plot size: 15'R)			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Tree vegetation plot was adjusted to accomodate size of wetland

SOIL

Sampling Point: DP-732

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	0.5Y 2.5/1	95	7.5YR 3/4	5	C	M	SiL	
7-15	10YR 4/1	90	7.5YR 4/6	10	C	M	SiL	
15-20	2.5Y 4/2	85	10YR 4/6	15	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/6/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-733

Investigator(s): Ben Virts and Nicole Duther Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 5-10

Subregion (LRR or MLRA): LRR-R Lat: 42.449514 Long: -79.132352 Datum: NAD 83

Soil Map Unit Name: Fremont Silt loam, 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for wetlands A629 and A630.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____ No X	Depth (inches):
Water Table Present?	Yes _____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____ No X	Depth (inches):

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators found.

VEGETATION – Use scientific names of plants. Sampling Point: DP-733

Tree Stratum (Plot size: 15'R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	80	Y	FACU
2. Fraxinus pennsylvanica	20	Y	FACW
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15'R)			
1. Acer saccharum	25	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	25	= Total Cover	

Herb Stratum (Plot size: 5'R)			
1. Toxicodendron radicans	60	Y	FAC
2. Rubus pensilvanicus	10	N	FACU
3. Acer saccharum	10	N	FACU
4. Fraxinus pennsylvanica	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85	= Total Cover	

Woody Vine Stratum (Plot size: 15'R)			
1. Toxicodendron radicans	5	Y	FAC
2.			
3.			
4.			
	5	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is borderline but meets hydrophytic requirements

SOIL

Sampling Point: DP-733

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Si	
6-20	2.5Y 4/4	100					SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

Not a hydric soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/6/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-734

Investigator(s): Ben Virts and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1-3?

Subregion (LRR or MLRA): LRR-R Lat: 42.44974111 Long: -79.132479 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam, 3-8% slope NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A630

Remarks: (Explain alternative procedures here or in a separate report.)

Pem wetland along edge of upland and open field. Slight topographic depression before open area turns into upland field

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water stained leaves found throughout the wetland

VEGETATION – Use scientific names of plants. Sampling Point: DP-734

Tree Stratum (Plot size: 10 x 20)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	

Sapling/Shrub Stratum (Plot size: 10 x 20)			
1. Salix purpurea	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5 x 5)			
1. Juncus effusus	27	Y	OBL
2. Onoclea sensibilis	5	N	FACW
3. Ranunculus acris	20	Y	FAC
4. Symphyotrichum puniceum	10	N	OBL
5. Solidago rugosa	10	N	FAC
6. Carex flava	28	Y	OBL
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 10 x 20)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation plot sizes were adjusted to fit within the boundaries of the wetland.

SOIL

Sampling Point: DP-734

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-6"	10YR 4/2	85	10YR 4/6	10	C	M	SIL	
			5YR 4/6	5	C	PL		
6-12"	2.5YR 4/6	95	10YR 4/6	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Soil is hydric and has redox concentrations in the top layer.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/7/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-738

Investigator(s): Ben Virts and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.4545949 Long: -79.1425368 Datum: NAD 83

Soil Map Unit Name: Fremont Silt loam 0 to 3 % Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No 633
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A 623

Remarks: (Explain alternative procedures here or in a separate report.)

PSS wetland in low spot of scrub/shrub field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Microtopographic relief due to small hummocks throughout. Drainage patterns throughout, low channels that carry water east to west of wetland.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-738

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus racemosa	20	Y	FAC
2. Cornus amomum	30	Y	FACW
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	60	Y	FACW
2. Cornus amomum	20	Y	FACW
3. Solidago rugosa	10	N	FAC
4. Fragaria virginiana	2	N	UPL
5. Symphyotrichum prenanthoides	5	N	FAC
6. Ranunculus acris	3	N	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-738

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/2	100					Si	
6-16	10YR 3/2	85	7.5YR 4/6	10	C	M	SiL	
			2.5Y 5/4	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Distinct Concentrations in the matrix found between 6-16 inches of soil profile of a dark matrix.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/7/10

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-739

Investigator(s): Ben Virts and Nicole Dunbar Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 3-10%

Subregion (LRR or MLRA): LRR-R Lat: 42.4543687 Long: -79.1426433 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam, 0 to 3% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for wetland A633.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-739

Tree Stratum (Plot size: 30'R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus americana	30	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15'R)			
1. Cornus racemosa	30	Y	FAC
2. Rosa multiflora	15	Y	FACU
3. Cornus amomum	5	N	FACW
4.			
5.			
6.			
7.			
	50	= Total Cover	
Herb Stratum (Plot size: 5'R)			
1. Solidago canadensis	30	Y	FACU
2. Cornus racemosa	20	Y	FAC
3. Toxicodendron radicans	5	N	FAC
4. Rubus pensilvanicus	5	N	FACU
5. Rosa multiflora	15	N	FACU
6. Fragaria virginiana	20	Y	UPL
7. Ranunculus acris	5	N	FAC
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30'R)			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-739

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3	100					SiL	
4-14	10YR 3/2	100					SiL	
14-20	2.5Y 5/6	85	2.5Y 3/2	10	D	M	SL	
			10YR 4/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/7/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-740

Investigator(s): Ben Virts and Nicole Duthie Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Concave Slope (%): 10-15%

Subregion (LRR or MLRA): LRR-R Lat: 42.455011 Long: -79.145378 Datum: NAD 83

Soil Map Unit Name: Fremont Silt loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland 634

Remarks: (Explain alternative procedures here or in a separate report.)

PFO portion of PFO/PEM wetland A634.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 740

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	80	Y	FACW
2. Fagus grandifolia	15	Y	FACU
3.			
4.			
5.			
6.			
7.			
	95	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Rosa multiflora	10	N	FACU
2. Fraxinus pennsylvanica	70	Y	FACW
3. Amelanchier canadensis	20	Y	FAC
4.			
5.			
6.			
7.			
	100	= Total Cover	

Herb Stratum (Plot size: 5' R)			
1. Impatiens capensis	60	Y	FACW
2. Persicaria virginiana	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70	= Total Cover	

Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-740

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 3/1	90	7.5YR 3/4	10	C	M	SiL	
10-18	2.5Y 4/3	80	2.5Y 3/1	15	D	M	CL	
			10YR 5/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soil because it has redox in the matrix of a dark soil.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/7/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-741

Investigator(s): Ben Virts and Nicole Quicker Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 3-10%

Subregion (LRR or MLRA): LRR-R Lat: 42.454890 Long: -79.145204 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland sample point for PEM/PFO wetland A634. Located on slight hillslope with mature secondary growth forest with little understory growth.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches):
Water Table Present?	Yes ____ No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydric hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-741

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Frangula alnus	55	Y	FAC
2. Malus prunifolia	15	N	UPL
3. Fraxinus americana	30	Y	FACU
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Frangula alnus	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	

Herb Stratum (Plot size: 5' R)			
1. Fraxinus americana	10	Y	FACU
2. Persicaria virginiana	20	Y	FAC
3. Rubus pensilvanicus	5	N	FACU
4. Fragaria virginiana	5	N	UPL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	

Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-741

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/4	100%					SiL	
2-17	10YR 4/6	100%					SiL	
17-20	10YR 4/4	90	10YR 4/2	10	D	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/7/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-742

Investigator(s): Ben Vitt and Nicole Dunther Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.455167 Long: -79.145220 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A634
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PEM portion of PEM/PFO wetland A634. PEM portion in depression and snowmobile trail.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 1"
Water Table Present?	Yes X	No ____	Depth (inches): 10"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-742

Tree Stratum (Plot size: 5' x 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' x 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Glyceria melicaria	50	Y	OBL
2. Impatiens capensis	20	Y	FACW
3. Symphyotrichum prenanthoides	5	N	FAC
4. Muhlenbergia schreberi	5	N	FAC
5. Fraxinus pennsylvanica	5	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: 5' x 20')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation plot sizes were adjusted to fit within the boundary of the wetland.

SOIL

Sampling Point: DP-742

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 2.5/1	100%					SiL	
6-14	2.5Y 4/2	50%	2.5Y 3/1	40	D	M	CL	
			7.5YR 4/6	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No ____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/7/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-743

Investigator(s): Bervins and Nicole Outner Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): linear concave Slope (%): 5-10

Subregion (LRR or MLRA): LRR-R Lat: 42.456362 Long: -79.146249 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam, 0 to 3% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point in the middle of snowmobile trail. 50 Ft. section of trail is a low spot where wetland vegetation and hydric soils are found but no evidence of hydrology.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-743

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus americana	20	Y	FACU
2. Fagus grandifolia	15	Y	FACU
3. Acer saccharum	5	N	FACU
4.			
5.			
6.			
7.			
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Cornus racemosa	5	N	FAC
2. Cornus amomum	30	Y	FACW
3. Rosa multiflora	10	Y	FACU
4.			
5.			
6.			
7.			
	45	= Total Cover	

Herb Stratum (Plot size: 5' R)			
1. Juncus effusus	10	N	OBL
2. Scirpus cyperinus	45	Y	OBL
3. Muhlenbergia frondosa	5	N	FACW
4. Trifolium repens	5	N	FACU
5. Scirpus atrovirens	15	Y	OBL
6. Onoclea sensibilis	5	N	FACW
7. Ranunculus acris	5	N	FAC
8.	25	Y	
9. Fragaria virginiana	5	N	UPL
10. Symphyotrichum prenanthoides	5	N	FAC
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	40	x 2 =	80
FAC species	15	x 3 =	45
FACU species	55	x 4 =	220
UPL species	5	x 5 =	25
Column Totals:	185 (A)		440 (B)

Prevalence Index = B/A = 2.38

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 743

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	2.5Y 3/1	90	2.5Y 5/6	5	C	M	SiL	
			7.5YR 4/6	5	C	M		
3-15	2.5Y 3/1	65	2.5Y 5/6	25	C	M	SiL	
			7.5Y 5/8	10	C	M		
15-20	2.5Y 5/2	80	2.5Y 3/1	15	D	M	SiL	
			7.5YR 4/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soils found in low spot of snowmobile trail, surrounded by upland area.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/8/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-748

Investigator(s): Ben Virts and Nicole Duthler Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 3-8?

Subregion (LRR or MLRA): LRR-R Lat: 42.43B154 Long: -79.120869 Datum: NAD 83

Soil Map Unit Name: Ashville Silt Loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID: A635B
Wetland Hydrology Present?	Yes X No	

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland in cow/bull pen, along both sides of stream A537.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (Inches):
Water Table Present?	Yes ___	No X	Depth (Inches):
Saturation Present? (Includes capillary fringe)	Yes ___	No X	Depth (Inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

In a depression between two upland/hills – geomorphic position.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-748

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' R)			
1. Rosa multiflora	10	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
Herb Stratum (Plot size: 5' R)			
1. Juncus effusus	10	N	OBL
2. Mentha aquatica	15	N	OBL
3. Ranunculus acris	5	N	FAC
4. Onoclea sensibilis	10	N	FACW
5. Impatiens capensis	5	N	FACW
6. Acorus calamus	30	Y	OBL
7. Eupatorium perfoliatum	5	N	FACW
8. Lysimachia nummularia	20	Y	FACW
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

PEM wetland, no trees rooted in wetland.

SOIL

Sampling Point: DP-748

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 2.5/1	95	5YR 3/4	5	C	M/PL	SiL	
10-	2.5Y 4/1	90	7.5YR 4/6	10	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/7/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-749

Investigator(s): Ben Virts and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 1-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.143875 Long: -79.121298 Datum: NAD 83

Soil Map Unit Name: Ashville Silt Loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point to wetland A2635B. Data point along edge of hillslope in a cow/bull pen.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed, none to be expected due to topography and location on hillslope.

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 749

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' R)			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Herb Stratum (Plot size: 5' R)			
1. Plantago lanceolata	20	Y	FACU
2. Ranunculus acris	5	N	FAC
3. Trifolium repens	20	Y	FACU
4. Taraxacum officinale	10	N	FACU
5. Carex festucacea	35	Y	FAC
6. Trifolium pratense	5	N	FACU
7. Daucus carota	5	N	UPL
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33,33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-749

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 4/3	80	2.5Y 3/2	20	D	M	SiL	
4-15	2.5Y 3/3	100					SiL	
15-20	2.5Y 3/3	90	2.5Y 4/3	5	D	M	SiL	
			2.5Y 3/2	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/8/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-751

Investigator(s): Ben Wirts and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 42.444661 Long: -79.122147 Datum: NAD 83

Soil Map Unit Name: Velai's gravelly Silt Loam, rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A836

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland in floodplain of Stream A512.

PEM wetland in forest with no trees noted in wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): 2"
Water Table Present?	Yes X	No ___	Depth (inches): 10"
Saturation Present? (Includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-751

Tree Stratum (Plot size: 10'x30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10'x30')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø	= Total Cover	
Herb Stratum (Plot size: 5'x5')			
1. Impatiens capensis	30	Y	FACW
2. Myosotis stricta	2	N	UPL
3. Onoclea sensibilis	10	N	FACW
4. Persicaria virginiana	5	N	FAC
5. Athyrium angustium	5	N	FAC
6. Glyceria melicaria	30	Y	OBL
7. Boehmeria cylindrica	10	N	OBL
8.			
9.			
10.			
11.			
12.			
	92	= Total Cover	
Woody Vine Stratum (Plot size: 10'x30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-7 SI

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 2.5/1	100					SI	
4-16	2.5Y 2.5/1	80	2.5Y 3/2	15	D	M	SL	
			7.5YR 4/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/8/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-752

Investigator(s): BenVirts and Nicole Outcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex Slope (%): 25%

Subregion (LRR or MLRA): LRR-R Lat: 42.144574 Long: -79.122103 Datum: NAD 83

Soil Map Unit Name: Valois gravelly Silt loam, Rolling NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for wetland (PEM) A636.

Upland on a hillslope with ATV/log road w/in 15' and main access road within 50'.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-752

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer Saccharum	40	Y	FACU
2. Betula alleghaniensis	40	Y	FAC
3. Tsuga Canadensis	10	N	FACU
4.			
5.			
6.			
7.			
	90	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Acer Saccharum	25	Y	FACU
2. Betula alleghaniensis	25	Y	FAC
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	

Herb Stratum (Plot size: 5' R)			
1. Dryopteris Marginalis	5	N	FACU
2. Betula alleghaniensis	15	Y	FAC
3. Fraxinus americana	5	N	FACU
4. Chamaepericlymenum canadense	3	N	FAC
5. Acer Saccharum	2	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	= Total Cover	

Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-752

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 2.5/1	100%					Si	
4-14	10YR 5/6	100%					SiL	
14-20	10YR 4/6	100%					SiL	with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/8/10

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-755

Investigator(s): Ben Wirts and Nicole Dutter Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave linear Slope (%): 0-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.419244 Long: -79.152070 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	If yes, optional Wetland Site ID: Wetland A635A
Wetland Hydrology Present?	Yes X	No	

Remarks: (Explain alternative procedures here or in a separate report.)

Linear PEM wetland along roadside that discharges to Ditch A507

Wetland borders active farm field with hydric soils but no hydrology or wetland vegetation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Drainage patterns run through wetland linearly and discharge to ditch A507.

Microtopographic relief due to drop off from built up road.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-7SS

Tree Stratum (Plot size: 5'x5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 5' x 5')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Typha angustifolia	45	Y	OBL
2. Symphyotrichum prenanthoides	30	Y	FAC
3. Ranunculus acris	5	N	FAC
4. Solidago rugosa	5	N	FAC
5. Equisetum palustre	10	N	FACW
6. Trifolium repens	5	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 5' x 5')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation plot sizes were adjusted to fit within the wetland boundary.

SOIL

Sampling Point: DP-7SS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100					SiL	
3-20	10YR 3/1	95	7.5Y 4/6	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/8/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-756

Investigator(s): Ben Virts and Nicole Dutcher Section, Township, Range: Town of Villenova

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.419496 Long: -79.152283 Datum: NAD 83

Soil Map Unit Name: Busti Silt Loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____ No X	

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for wetland (PEM) A635A

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches):

Water Table Present? Yes ____ No X Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

VEGETATION – Use scientific names of plants. Sampling Point: DP-756

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Robinia pseudoacacia	10	Y	FACU
2. Acer saccharum	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Malus prunifolia	5	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	

Herb Stratum (Plot size: 5' R)			
1. Ranunculus acris	15	Y	FAC
2. Dactylis glomerata	25	Y	FACU
3. Trifolium pratense	5	N	FACU
4. Trifolium repens	5	N	FACU
5. Plantago lanceolata	5	N	FACU
6. Asclepias syriaca	10	N	UPL
7. Scirpus atrovirens	20	Y	OBL
8. Muhlenbergia frondosa	15	Y	FACW
9.			
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.92 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-756

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/2	100					SL	
3-8	10YR 4/2	95	7.5YR 5/6	5	C	M/PL	SiL	
8+								Rock + compaction refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/9/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-758

Investigator(s): Ben Virts and Nicole Owsley Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-5%

Subregion (LRR or MLRA): LRR-R Lat: 42.474929 Long: -79.149434 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam, 0 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A638
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PFO wetland in depression of large upland area. Surrounded by upland cultivated hay fields. Drains to ditch A50 along NE edge where wetland boundary is.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Drainage patterns run around the western side of the wetland (looks to be an old ditch that normal circumstances have now been border of wetland. Iron deposits were found in significant portions of wetland on top of soil surface. Oxidized rhizospheres on living roots found in hydric soils.

VEGETATION – Use scientific names of plants. Sampling Point: DP-758

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americana	50	Y	FACW
2. Fraxinus pennsylvanica	25	Y	FACW
3. Rhamnus cathartica	15	N	FACU
4. Lonicera tatarica	10	N	FACU
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Rhamnus cathartica	15	Y	FACU
2. Lonicera tatarica	30	Y	FACU
3. Rosa multiflora	10	N	FACU
4.			
5.			
6.			
7.			
	55	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Euthamia graminifolia	40	Y	FAC
2. Ulmus americana	20	Y	FACW
3. Fraxinus pennsylvanica	20	Y	FACW
4. Rosa multiflora	5	N	FACU
5. Toxicodendron radicans	15	N	FAC
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Toxicodendron radicans	10	Y	FAC
2.			
3.			
4.			
	10	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

FAC and FACU invasive species grow in all landscape/cover types in this region they are ~~opporta~~ opportunistic and have been seen growing in wetlands as well here in NY.

SOIL

Sampling Point: DP-7 S8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	85	5YR 4/6	15	C	M/PL	CL	
7-16	2.5Y 4/2	80	10YR 5/8	10	C	M	CL	
			10YR 3/1	10	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Hydric soils because of redox concentrations in the matrix and along lining pore linings.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/9/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-759

Investigator(s): Ben Uirts and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): none

Subregion (LRR or MLRA): LRR-R Lat: 42.475101 Long: -79.149453 Datum: NAD 83

Soil Map Unit Name: Fremont Silt Loam, 0 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point to wetland AB38 (PFO). Data point taken on edge of cultivated hay field. Upland field next to ditch AS09 that drains field so it can be harvested for hay.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-759

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	20	Y	FACU
2. Acer saccharum	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Rosa multiflora	15	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Euthamia graminifolia	10	N	FAC
2. Muhlenbergia frondosa	40	Y	FACW
3. Ranunculus acris	10	N	FAC
4. Trifolium pratense	30	Y	FACU
5. Plantago lanceolata	5	N	FACU
6. Daucus carota	5	N	UPL
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-7 S9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	2.5Y 3/2	90	5YR 4/6	10	C	M	CL	
14-20	2.5Y 5/1	80	5YR 4/6	20	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Soils are hydric but remnant hydric because they are immediately next to a ditch ~~that~~ is lowering the water table.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/9/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-703

Investigator(s): Ben Vista and Nicole Dorher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 1-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.479556 Long: -79.149194 Datum: NAD 83

Soil Map Unit Name: Tioga Silt Loam, 3 to 8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: A639

Remarks: (Explain alternative procedures here or in a separate report.)

PFO wetland in floodplain of Stream A540. Floodplain wetland is in a ravine/confined valley. Groundwater discharge to the stream where the stream starts to drop off and bedrock is exposed. Receives some groundwater seep from eastern bank of ravine.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 0.5"
Water Table Present?	Yes X	No ____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Iron deposits where groundwater is discharged from wetland to stream. Water stained leaves found throughout wetland and floodplain.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-763

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	20	Y	FACU
2. Betula alleghaniensis	20	Y	FAC
3. Fagus grandifolia	10	N	FACU
4. Acer saccharum	5	N	FACU
5.			
6.			
7.			
	55	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	15	Y	FACU
2. Betula alleghaniensis	15	Y	FAC
3. Lindera benzoin	10	N	FACW
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	20	Y	FACW
2. Carex flava	40	Y	OBL
3. Euthamia graminifolia	5	N	FAC
4. Betula alleghaniensis	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	70	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 763

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	Gley1 2.5/10Y	100%					SiL	
8-20	2.5Y 3/1	75%	Gley1 5/N	15	RM	M	C	
			7.5YR 4/4	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/9/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-7604

Investigator(s): Ben Viets and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 30?

Subregion (LRR or MLRA): LRR-R Lat: 42.479503 Long: -79.149046 Datum: NAD 83

Soil Map Unit Name: Towerville Silt Loam, 35 to 50% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for PFO wetland A639. Data point located near wetland in confined valley on the hillslope

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-764

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	45	Y	FACU
2. Betula alleghaniensis	50	Y	FAC
3. Tsuga canadensis	5	N	FACU
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer saccharum	25	Y	FACU
2. Betula alleghaniensis	30	Y	FAC
3.			
4.			
5.			
6.			
7.			
	55	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Betula alleghaniensis	10	Y	FAC
2. Acer saccharum	10	Y	FACU
3. Trillium grandiflorum	2	N	UPL
4. Rubus idaeus	2	N	FACU
5. Toxicodendron radicans	5	N	FAC
6. Dryopteris marginalis	2	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	31	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x 1 =	—
FACW species	—	x 2 =	—
FAC species	95	x 3 =	285
FACU species	89	x 4 =	356
UPL species	2	x 5 =	10
Column Totals:	186 (A)		651 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-764

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	2.5Y 5/4	90	7.5YR 4/6	10	C	M	SiL	
13-20	2.5Y 5/4	80	7.5YR 4/6	20	C	M	SiL	
			2.5Y 5/2	5	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/10/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-7168

Investigator(s): Ben Viets and Nicole Dunker Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-3%

Subregion (LRR or MLRA): LRR-R Lat: 42.484607 Long: -79.149711 Datum: NAD 83

Soil Map Unit Name: HrB Hornell silt loam, 3 to 8 % slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID: A1040

Remarks: (Explain alternative procedures here or in a separate report.)

PEM wetland in concave depression of forest. Wetland extend just beyond study limits and looks to have discharge to ditch outside study area along old railroad bed. Area burned up along old railroad bed, which is causing water to pond during parts of the year.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Sparsely vegetated concave surface, area doesn't have surface water now but evidence of ponding/standing water during parts of the year. Geomorphic Position → water being stopped by burm that was built up for ~~the~~ railroad.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-768

Tree Stratum (Plot size: 20'x20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	Ø = Total Cover		
Sapling/Shrub Stratum (Plot size: 15'x15')			
1. Lindera benzoin	20	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		
Herb Stratum (Plot size: 5'x5')			
1. Lindera benzoin	10	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: 20'x20')			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-7 & 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	2.5Y 3/1	90	7.5YR 3/4	10	C	M	SiL	
7-17	2.5Y 4/2	80	2.5Y 3/1	15	D	M	CL	
			7.5Y 4/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/6/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-769

Investigator(s): Ben Uitts and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Convex Slope (%): 5-8%

Subregion (LRR or MLRA): LRR-R Lat: 42.484825 Long: -79.149637 Datum: NAD 83

Soil Map Unit Name: HrB - Hornell silt loam, 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point for wetland (PEM in forest) A640. Located near berm of old railroad bed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-709

Tree Stratum (Plot size: 30'R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer Saccharum	95	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	95	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15'R)			
1. Acer Saccharum	20	Y	FACU
2. Lindera benzoin	10	Y	FACW
3. Fagus grandifolia	10	Y	FACU
4. Fraxinus pennsylvanica	5	N	FACW
5.			
6.			
7.			
	45	= Total Cover	
Herb Stratum (Plot size: 5'R)			
1. Toxicodendron radicans	10	Y	FAC
2. Fraxinus pennsylvanica	5	N	FACW
3. Fagus grandifolia	5	N	FACU
4. Trillium erectum	2	N	FAC
5. Fragaria Virginiana	25	Y	FAC
6. Lonicera tatarica	3	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: 30'R)			
1. Vitis aestivalis	10	Y	FACW
2.			
3.			
4.			
	10	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.9 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	—	x 1 =	—
FACW species	20	x 2 =	40
FAC species	37	x 3 =	111
FACU species	143	x 4 =	572
UPL species	—	x 5 =	—
Column Totals:	200 (A)		723 (B)

Prevalence Index = B/A: 3.61

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-769

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 3/3	100					SiL	
6-20	2.5Y 5/4	75	2.5Y 4/2	10	D	M	CL	
			10YR 5/8	15	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/10/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-773

Investigator(s): Ben Urstr and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.488841 Long: -79.149921 Datum: NAD 83

Soil Map Unit Name: BrB - Barcelona silt loam, 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	A641

Remarks: (Explain alternative procedures here or in a separate report.)

PEM data point for wetland A641. Starting at stream A546 alluvial fan

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): 0"
Water Table Present?	Yes X	No ___	Depth (inches): 7"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-773

Tree Stratum (Plot size: 15' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus americana	10	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' R)			
1. Ulmus americana	15	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	15 = Total Cover		
Herb Stratum (Plot size: 5' R)			
1. Onoclea sensibilis	15	N	FACW
2. Impatiens capensis	10	N	FACW
3. Toxicodendron radicans	5	N	FAC
4. Leersia oryzoides	70	Y	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 15' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation plot size adjusted to fit in the confines of the wetland

SOIL Sampling Point: DP- 773

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5Y 4/1	70	5YR 3/4	30	C	M/PL	Si	
6-20	2.5Y 4/1	95	5YR 3/4	5	C	M	SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/10/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-774

Investigator(s): Ben Vitt and Nicole Dutcher Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): ~~footslope~~ dep. Local relief (concave, convex, none): Concave Slope (%):

Subregion (LRR or MLRA): LRR-R Lat: 42.4898576 Long: -79.1505612 Datum: NAD 83

Soil Map Unit Name: Barcelona Silt Loam, 3 to 8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	Yes X No
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	A641
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PSS portion of wetland A641.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Drainage patterns throughout, running towards North end where it pools more and turns into PEM. Western section of wetland along the slope of hillside.

VEGETATION – Use scientific names of plants. Sampling Point: DP-774

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' R)			
1. Salix nigra	50	Y	OBL
2. Cornus racemosa	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
	70 = Total Cover		
Herb Stratum (Plot size: 5' R)			
1. Symphyotrichum puniceum	10	N	OBL
2. Ranunculus acris	5	N	FAC
3. Symphyotrichum prenanthoides	10	N	FAC
4. Impatiens capensis	20	Y	FACW
5. Lysimachia nummularia	20	Y	FACW
6. Toxicodendron radicans	38	Y	FAC
7.	2	N	
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-774

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	2.5Y 4/2	85	5YR 3/4	15	C	M	SiL	
10-16	2.5Y 4/2	85	2.5Y 4/1	10	D	M	CL	
			7.5YR 4/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/10/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-775

Investigator(s): Ben Viets and Nicole Dutmer Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 5-10

Subregion (LRR or MLRA): LRR-R Lat: 42.489858 Long: -79.1505612 Datum: NAD 83

Soil Map Unit Name: NgA - Niagara silt loam, 0-3% slopes, loamy substratum NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland data point to wetland A641. On a hillslope leading down to wetland.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (Includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-775

Tree Stratum (Plot size: 30 R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus Pennsylvanica	30	Y	FACW
2. Acer Saccharum	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' R)			
1. Lonicera tartarica	50	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	
Herb Stratum (Plot size: 5' R)			
1. Solidago Canadensis	30	Y	FACU
2. Lonicera tartarica	50	Y	FACU
3. Toxicodendron radicans	10	N	FAC
4. Fragaria virginiana	5	N	FAC
5. Parthenocissus quinquefolia	5	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

__ 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No N

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-775

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/3	100					SiL	
8-20	2.5Y 5/6	75	2.5Y 4/3	5	D	M	CL	
			2.5Y 4/2	10	D	M		
			10YR 5/6	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/21/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-177

Investigator(s): B. Vints, J. Seuberi Section, Township, Range: Town of Harmony

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.4993629 Long: -79.1536755 Datum: NAD 83

Soil Map Unit Name: Niagara Si Hloam 10 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A613
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

Pem Oak Station for Wetland A613.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):
Water Table Present?	Yes ___	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 777

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Impatiens capensis	80	yes	FACW
2. Eupatorium perfoliatum	10	no	FACW
3. Zizania aquatica	10	no	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1. Not applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-777

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	2.5y4/2	90	5yR 5/6	10	C	M	SIL	
8"-16"	2.5y4/1	80	2.5y4/2	10	D	M	SIL	
			5yR 5/6	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/21/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-778

Investigator(s): B Viets, Jeremy Sender Section, Township, Range: Town of Harmony

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1%

Subregion (LRR or MLRA): LRR-R Lat: 42.4994454 Long: -79.1538008 Datum: NAD 83

Soil Map Unit Name: Niagara Silt loam, 0 to 3% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A643.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 778

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharum	45	Yes	FACU
2. Carya ovata	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	65	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer Saccharum	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	15	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Podophyllum peltatum	10	Yes	FACU
2. Euthamia graminifolia	10	Yes	FAC
3. Fraxinus Pennsylvanica	5	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Not Applicable			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	10	x 3 =	30
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	105 (A)		400 (B)

Prevalence Index = B/A = 3.81

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-778

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-8"	2.5Y5/3	100					SL	
8"-20"	2.5Y6/3	80	2.5Y 5/6	20			SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/21/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-779

Investigator(s): B. Viers, J. Snyder Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-R Lat: 42.503809 7 Long: -79.1528564 Datum: NAD 83

Soil Map Unit Name: Niagara Silt loam, 0 to 3% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland AG14
Wetland Hydrology Present?	Yes X No		

Remarks: (Explain alternative procedures here or in a separate report.)

PFO Data Point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches):

Water Table Present? Yes ____ No ____ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP- 779

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	35	Yes	FAC
2. Fraxinus pensylvanica	15	Yes	FACW
3. Tsuga canadensis	10	no	FACU
4.			
5.			
6.			
7.			
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer rubrum	10	Yes	FAC
2. Fraxinus pensylvanica	5	Yes	FACW
3. Tsuga canadensis	5	Yes	FACU
4.			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Toxicodendron radicans	20	Yes	FAC
2. Impatiens capensis	10	Yes	FACW
3. Carex intumescens	10	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia	10	Yes	FAC
2.			
3.			
4.			
	10	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 89% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP- 779

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-2"	2.5y 3/1	100%					SI	
2"-14"	2.5y 6/1	75%	7.5yr 5/6	25%	C	M	SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes X No _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 6/21/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP- 780

Investigator(s): B. Vinss, J. Scudari Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.504069 Long: -79.153164 Datum: NAD 83

Soil Map Unit Name: Niagara silt loam, 0 to 3% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ND, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ND, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland Data Point for Wetland A644.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (Includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-780

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer Saccharum	80	Yes	FACU
2. Pinus Sertina	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Acer Saccharum	30	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Podophyllum peltatum	20	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. Vitus aestivalis	10	Yes	FACU
2.			
3.			
4.			
	10	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	160	x 4 =	640
UPL species	0	x 5 =	0
Column Totals:	160 (A)		640 (B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-780

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0"-1"	2.5y3/2						SI	
1"-7"	10yr4/4						SI	
7"-20"	10yr4/6						SIL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 7/15/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-783

Investigator(s): Ben Virts and Nicole Dutzler Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 0-2%

Subregion (LRR or MLRA): LRR-R Lat: 42.448426 Long: -79.124072 Datum: NAD 83

Soil Map Unit Name: Fremont silt loam, 3-8% slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes X No		
Wetland Hydrology Present?	Yes X No	If yes, optional Wetland Site ID:	Wetland A645

Remarks: (Explain alternative procedures here or in a separate report.)

PEM data point for wetland A645 - PEM wetland in forest w/ no trees rooted in wetland.

Region has experienced below average rainfall for year to date.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Evidence of water-stained leaves and drainage patterns found throughout the wetland. No saturation / water table / surface water observed due to the region receiving below average rainfall year-to-date (NYS DEC announced 7/15/16 drought warning).

VEGETATION – Use scientific names of plants.

Sampling Point: DP-783

Tree Stratum (Plot size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Sapling/Shrub Stratum (Plot size: 10')			
1. Not Applicable			
2.			
3.			
4.			
5.			
6.			
7.			
	0 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Onoclea sensibilis	80	Y	FACW
2. Carex flava	5	N	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		

Woody Vine Stratum (Plot size: 15')			
1. Not Applicable			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DP-783

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 2.5/1	90%	5YR 4/4	10%	C	M	SiL	
4-12	2.5Y 5/2	95%	7.5YR 4/6	5%	C	M		
12+								Rock/gravel refusal

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

Soil demonstrates a depleted matrix and redox of dark surface in the first 4" layer. Rock and gravel refusal found at 12" (multiple pits were attempted to get further down).

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Ball Hill Wind Project City/County: Chautauqua County Sampling Date: 7/15/16

Applicant/Owner: Ball Hill Wind Energy, LLC State: NY Sampling Point: DP-784

Investigator(s): Ben Virts and Nicole Dutter Section, Township, Range: Town of Hanover

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 5%

Subregion (LRR or MLRA): LRR-R Lat: 42.448520 Long: -79.124059 Datum: NAD 83

Soil Map Unit Name: Fremont Silt loam, 3-8% Slopes NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland ~~soil~~ data point for Wetland AL045.

Area has received below average rainfall year-to-date, NYS DEC announced drought warnings for all NYS on 7/15/16.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches):
Water Table Present?	Yes ____	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches):

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No hydrology indicators observed.

VEGETATION – Use scientific names of plants.

Sampling Point: DP-784

Tree Stratum (Plot size: 30' R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Tsuga canadensis	80	Y	FACU
2. Fagus grandifolia	20	Y	FACU
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' R)			
1. Fagus grandifolia	10	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	

Herb Stratum (Plot size: 10' R)			
1. Athyrium angustium	10	Y	FAC
2. Fagus grandifolia	5	Y	FACU
3. Onoclea sensibilis	5	Y	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20	= Total Cover	

Woody Vine Stratum (Plot size: 30' R)			
1. Not Applicable			
2.			
3.			
4.			
	Ø	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-784

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/4	100%					Si	
2-20	2.5Y 5/4	100%					Si	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L, M)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:

No hydric soil indicators were observed.

APPENDIX B
STREAM DATA FORMS

STREAM FIELD ID: ST10

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:

Date: 11/04/2015

County: Chautauqua

State: New York

Evaluator(s): DSC, VSM

Data Point ID: DP-54

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction West to East

Width (ft) (water's edge to water's edge) 5

Width (ft) (bank to bank) 25

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [X] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[X]	51 - 100% (38-45°)	[X]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

No evidence of erosion observed

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: Hemlock forest

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [X] yes [ ] no
If yes, list: Macro invertebrates

Riparian/Terrestrial Organisms
[X] yes [ ] no
If yes, list: Squirrel, chipmunk, deer

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [X] Intermediate >10 ft, <100ft
- [ ] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo # 70 Right to left north

Photo # 71 upstrm west

Photo # 72 dwnstrm east

STREAM FIELD ID: ST-11

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:

Date: 11/05/2015

County: Chautauqua

State: New York

Evaluator(s): DJL, VJM

Data Point ID: DP-63

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction South to North

Width (ft) (water's edge to water's edge) 2 feet

Width (ft) (bank to bank) 4

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [X] Gravel
- [X] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[X]	21 - 50% (12-27°)	[X]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Unpaved Trail & Culvert Crossing

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list:

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: WL-V1

Aquatic Organisms [X] yes [ ] no
If yes, list: Macroinvertebrates

Riparian/Terrestrial Organisms [X] yes [ ] no
If yes, list: deer, squirrel, chipmunks

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 81 Right to left WEST

Photo 82 upstrm South

Photo 83 dwnstrm North

STREAM FIELD ID: ST 13

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:

Date: 11/05/2015

County: Chautauqua

State: New York

Evaluator(s): DJL, VSM

Data Point ID: 69

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction South To north

Width (ft) (water's edge to water's edge) 5

Width (ft) (bank to bank) 10

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [ ] 7 - 12"
- [X] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
0-3' High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
3-6' High		
[ ]	0 - 20% (0-11°)	[ ]
[X]	21 - 50% (12-27°)	[X]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
6' + High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

No erosion observed

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: Forest, hemlock Beech

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [X] yes [ ] no
If yes, list: minnows / macro invertebrates

Riparian/Terrestrial Organisms
[X] yes [ ] no
If yes, list: deer, squirrel, Chipmunk

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [X] Intermediate >10 ft, <100ft
- [ ] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 88 Right To left west

Photo 89 upstream south

Photo 90 downstream north

FISHER ASSOCIATES

STREAM FIELD ID: ST-14

Project Name: Ball Hill Wind Project

Stream Name:

Date: 11/06/2015

County: Chautauqua

State: New York

Evaluator(s): DJL, VJM

Data Point ID: DP-72

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction South to North

Width (ft) (water's edge to water's edge) 1

Width (ft) (bank to bank) 1

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

No erosion observed

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: SOF Goldenrod

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: WL-V3

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [X] yes [ ] no
If yes, list: birds deer

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 96 Right to Left

Photo 97 upstream south

Photo 98 downstream north

STREAM FIELD ID: DP-73/ST-15

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:

Date: 11/6/15

County: Chautauqua

State: New York

Evaluator(s): DSL, VSM

Data Point ID: DP-73

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 3 ft

Width (ft) (bank to bank) 3.5 ft

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [X] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[X]	51 - 100% + (38-45°)	[X]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: Reed canary

Aquatic Vegetation [X] yes [ ] no
If yes, list: Algae

Associated Wetland [X] yes [ ] no
If yes, list ID: WL-V3

Aquatic Organisms [X] yes [ ] no
If yes, list:

Riparian/Terrestrial Organisms
[X] yes [ ] no
If yes, list: Vole/Shrew

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

PH-99 Right to Left Bank (W)

PH-100 Upstream (W) PH to Downstream (E)

Vole/Shrew spp.

STREAM FIELD ID: ST-18

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 11/12/15

County: Chautauqua

State: New York

Evaluator(s): M. Boberg O. Lockwood

Data Point ID: 90

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction EAST

Width (ft) (water's edge to water's edge) 2-5'

Width (ft) (bank to bank) 5-6'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [X] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

minor erosion on banks from cow's crossing.

Associated Habitat

Riparian Vegetation [ ] yes [X] no
If yes, list:

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: WL-A3

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

PHOTO # 119 US/W

PHOTO 120 DS/E

PHOTO 118 RTC/N

STREAM FIELD ID: ST-19

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:	Date: 11/12/2015
County: Chautauqua	State: New York
Evaluator(s): DTL, MAB	Data Point ID: DP-95

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction East to West

Width (ft) (water's edge to water's edge) 3

Width (ft) (bank to bank) 5

Bottom Characteristics

Substrate Type:
- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):
- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[X]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[X]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

No erosion observed

Associated Habitat

Riparian Vegetation [ ] yes [X] no
If yes, list: Active pasture

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [X] yes [ ] no
If yes, list: macroinvertebrates

Riparian/Terrestrial Organisms [X] yes [ ] no
If yes, list: cattle, rabbit, small mammals

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 125 Right to left North

Photo 126 upstream West

Photo 127 Downstream East

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A200(EPH)
Data Point ID: DP- 210 Date: 5/20/16
Project Name: Ball Hill Wind Project
Evaluator(s): J. ZSIROS & S. BUCKENMEYER
County: Chautauqua State: NY
Stream Name: N/A
State Classified: Yes [X] No [ ] Not Applicable [ ]
If Yes, Classification: C, C
Lat: 42.417696 Long: -79.136144

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: NW

Geomorphologic Characteristics

Primary Substrate Class: Gravel/Sand/Silt; Secondary: Cobble

	Width	
	at DP	Max
OHWM	2'	2'
Top of Bank	7.5'	7.5'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Banks eroded

Right Bank: Banks eroded

Habitat Characteristics

Aquatic Vegetation Present: Yes [X] No [ ]
If Yes, Describe: Impatiens capensis in & along channel
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 210

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: P. pensylvanica, Impatiens spp. S. americanus, Crooked stemmed aster

Left: S. rugosa, T. canadensis, Crooked stem aster

Associated Wetland Present: Yes ☐ No ☒

If Yes, Describe:

Associated Artificial Drain Present: Yes ☐ No ☒

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	NW	
Cross Channel	SE	

Jurisdictional Connectivity Notes:

Tidely originates from drain tiles from adjacent ag. field. Transitions into an intermittent

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A200(INT)
Data Point ID: DP- 211 Date: 5/26/16
Project Name: Ball Hill Wind Project
Evaluator(s): J. STROJ & S. BUCKENMEYER
County: Chautauqua State: NY
Stream Name: N/A
State Classified: Yes [X] No [ ] Not Applicable [ ]
If Yes, Classification: C, C
Lat: 42.417081 Long: -79.137323

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 3" Wetted Perimeter Width: 3'
Flow/Gradient Direction: N

Geomorphologic Characteristics

Primary Substrate Class: Sand/Silt Secondary: Cobble

	Width	
	at DP	Max
OHWM	5'	10'
Top of Bank	6'	20'

	Left	Right
Bank Slope (H:V)	1:4	1:2

Bank Stability Summary

Left Bank: Slightly
Right Bank: Raw & eroded

Habitat Characteristics

Aquatic Vegetation Present: Yes [X] No [ ]
If Yes, Describe: Impatiens capensis growing in channel
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 211

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: T. canadensis, B. alleghenensis, A. saccharum, O. intermedia

Left: Same

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe:

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	NE	
Dowsnstream	SE	
Cross Channel	E	R to L

Jurisdictional Connectivity Notes:

Extends outside of search area. Stream appears to contain sub-surface flow. Transition from ephemeral to intermittent. Likely begins from drain tiles or is hydrologically supplemented from these tiles

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A202
Data Point ID: DP-222 Date: 5/24/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Z and Nicole Ostler
County: Chautauqua State: NY
Stream Name: N/A
State Classified: Yes [ ] No [ ] Not Applicable [X]
If Yes, Classification:
Lat: 42.420006 Long: -79.135808

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 2 in Wetted Perimeter Width: 2ft
Flow/Gradient Direction: West

Geomorphologic Characteristics

Primary Substrate Class: Silt some cobbles

	Width	
	at DP	Max
OHWM	2 in	8 in
Top of Bank	2.5 ft	7 ft

	Left	Right
Bank Slope (H:V)	1:3	1:1

Bank Stability Summary

Left Bank: Mostly Stable by herbaceous plants. Some erosion where it meanders
Right Bank: Very Stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [X] No [ ]
If Yes, Describe: tadpoles in deep pools
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 222

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-150' - herbacious/field cover

Left: 0-100' - herbacious plants
100-150' - cultivated crop field

Associated Wetland Present: Yes [✓] No [ ]

If Yes, Describe: WL-A209

Associated Artificial Drain Present: Yes [✓] No [ ]

If Yes, ID: ~~DTCA200~~

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	W	
Cross Channel	N	LTR

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

Stream located in active hayfield, likely modified in the past

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A203
Data Point ID: DP- 243 Date: 5/26/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Jones
County: Chautauqua State: NY
Stream Name: N/A
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.396578 Long: -79.151477

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 0.5" Wetted Perimeter Width: 2'
Flow/Gradient Direction: N

Geomorphologic Characteristics

Primary Substrate Class: Gravel / Sand; Secondary cobble, silt

	Width	
	at DP	Max
OHWM	4'	6'
Top of Bank	5'	7'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Incised channel - moderate stability

Right Bank: Incised channel - moderate stability

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 343

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: WL - A220, Upland - P. tremuloides, P. virginica

Left: P. pensylvanica, A saccharum, C. gracilima

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: WL - A220

Associated Artificial Drain Present: Yes [X] No [ ]

If Yes, ID: AD - 203 (4" drain tile)

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	L to R

Jurisdictional Connectivity Notes:

Extends outside of delineation area

Supplemental Notes & Comments:

Stream begins from an agricultural tile just outside of delineation area. Incised channel, sorted sediment, sinuosity is 1 within search area

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A204

Data Point ID: DP-249 Date: 5/06/16

Project Name: Ball Hill Wind Project

Evaluator(s): Jaime Zuras

County: Chautauqua State: NY

Stream Name: N/A

State Classified: Yes [X] No [ ] Not Applicable [ ]

If Yes, Classification: C, C

Lat: 42.393235 Long: -79.141472

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]

Surface Water: Present [X] Absent [ ]

Perceptible Flow: Present [X] Absent [ ]

Water Depth at Thalweg: 7" Wetted Perimeter Width: 8

Flow/Gradient Direction: SE

Geomorphologic Characteristics

Primary Substrate Class:

	Width	
	at DP	Max
OHWM	8	9
Top of Bank	9	10

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Incised channel - moderate stability

Right Bank: Incised channel - moderate stability

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]

If Yes, Describe:

Aquatic Organisms Observed: Yes [X] No [ ]

If Yes, Describe: Minnows (unidentified), water skippers, Stoneflies & mayflies

Terrestrial Organisms Observed: Yes [ ] No [X]

If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 249

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: WL-A222, J. canadensis

Left: Pasture with rumble weed, D. glomerata, J. effusal

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: WL-A222

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	NW	
Dowsnstream	SE	
Cross Channel	SW	L-R

Jurisdictional Connectivity Notes:

WL-A222 & DT-A201. Extends outside of search area

Supplemental Notes & Comments:

Small riffle/pool complexes. Incised channels low sinuosity.

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A304
Data Point ID: DP- 261 Date: 5/31/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Jones
County: Chautauqua State: NY
Stream Name: N/A
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification: Flows into state classified C
Lat: 42.388510 Long: -79.145813

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 1" Wetted Perimeter Width: 24
Flow/Gradient Direction: NE

Geomorphologic Characteristics

Primary Substrate Class: Cobble / Sand / Gravel

	Width	
	at DP	Max
OHWM	24"	4'
Top of Bank	3.5'	5.5'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Water skippers, Coleoptera
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 261

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: F. grandifolia forest

Left: T. canadensis forest

Associated Wetland Present: Yes [ ] No [X]

If Yes, Describe:

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	NE	
Cross Channel	W	R to L

Jurisdictional Connectivity Notes:

Flows into ST-A509, a NY state listed stream

Supplemental Notes & Comments:

Higher gradient stream extending outside of delineation area

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST - AD05
Data Point ID: DP- 272 Date: 6/1/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Bonos
County: Chautauqua State: NY
Stream Name: ?
State Classified: Yes [X] No [ ] Not Applicable [ ]
If Yes, Classification: A, A
Lat: 42.451975 Long: -79.111869

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: ____ Wetted Perimeter Width: ____
Flow/Gradient Direction: E

Geomorphologic Characteristics

Primary Substrate Class: Sand / Gravel ; Secondary cobble & boulder

	Width	
	at DP	Max
OHWM	9'	15'
Top of Bank	16	20'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Moderately stable

Right Bank: Moderately stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [X] No [ ]
If Yes, Describe: D. capensis (scattered)
Aquatic Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Water skippers, damselflies
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe: ____

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 272

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Deciduous upland forest - T. canadensis
A. saccharum, Rubus allegheniensis

Left: Same

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: WL-A234

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	W	
Dowsnstream	E	
Cross Channel	S	L to R

Jurisdictional Connectivity Notes:

Extends outside of delineation area

Supplemental Notes & Comments:

Small riffle pool complexes. Left bank exhibits incised channels. Right bank slopes ranges between 1:3 to 1:1. Sinuosity is ~3.5 within delineation area.

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A306
Data Point ID: DP- 275 Date: 6/1/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Zuniga
County: Chautauqua State: NY
Stream Name: UNT
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification: Connects to a A, A designated stream
Lat: 42.452330 Long: -79.114053

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: S

Geomorphologic Characteristics

Primary Substrate Class: Clay transitioning to sand & gravel

	Width	
	at DP	Max
OHWM	2'	2'
Top of Bank	2.5'	2.5'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 275

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Open field transitioning to forested

Left: Open field transitions to forested

Associated Wetland Present: Yes ☐ No ☒

If Yes, Describe: Connects with a WL outside of search area

Associated Artificial Drain Present: Yes ☐ No ☒

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	N	
Dowsnstream	S	
Cross Channel	E	

Jurisdictional Connectivity Notes:

Connects with a state classified stream and a wetland outside of delineation area

Supplemental Notes & Comments:

Stream appears to have formed from ag field runoff. No evidence of a channel

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST - A207
Data Point ID: DP- 278 Date: 6/1/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime ZSIRosand Nicole Dutcher
County: Chautauqua State: NY
Stream Name: unnamed trib of
State Classified: Yes [X] No [ ] Not Applicable [ ]
If Yes, Classification: A:A
Lat: 42.452641 Long: -79.115992

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 6in Wetted Perimeter Width: 3'
Flow/Gradient Direction:

Geomorphologic Characteristics

Primary Substrate Class: silt / SAND

	Width	
	at DP	Max
OHWM	3'	5'
Top of Bank	3'	8'

	Left	Right
Bank Slope (H:V)	2:1	2:1

Bank Stability Summary

Left Bank: Very stable, vegetated, some undercutting

Right Bank: Stable, vegetated to bank, undercutting at meandering points

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [X] No [ ]
If Yes, Describe: water spiders/skiders
Terrestrial Organisms Observed: Yes [X] No [ ]
If Yes, Describe: frogs, snails

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 278

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-20 ft PEM/PSS Wetland
20-150 ft Upland vegetated field

Left: 0-30 ft PEM/PSS wetland
30-50 ft Upland bordering crop field, 50-150 - Cultivated crop

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: WL-A236

Associated Artificial Drain Present: Yes [X] No [ ]

If Yes, ID: AD-205

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	E	R to L

Jurisdictional Connectivity Notes:

Ditch extends outside of delineation area.

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A209
Data Point ID: DP- 285 Date: 6/2/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Zuras
County: Chautauqua State: NY
Stream Name: UNT
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification: Connects to a C, state classified stream
Lat: _____ Long: _____

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [Y]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: NW

Geomorphologic Characteristics

Primary Substrate Class: Clay, Secondary cobble

	Width	
	at DP	Max
OHWM	20"	25"
Top of Bank	30"	40"

	Left	Right
Bank Slope (H:V)		

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe: _____
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe: _____
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe: _____

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 285

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Deciduous forest (J. americana, a saccharum)

Left: Deciduous forest (J. americana, a saccharum

Associated Wetland Present: Yes [ ] No [X]

If Yes, Describe:

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	NW	
Cross Channel	S	R to L

Jurisdictional Connectivity Notes:

Flows into ST-A003(PPH). Ultimately connects with a state listed stream.

Supplemental Notes & Comments:

High gradient ephemeral. Leaf litter disturbance rated

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A208
Data Point ID: DP-286 Date: 6/2/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Evans
County: Chautauqua State: NY
Stream Name: UNT
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification: Flows into a state classified (A, C)
Lat: 42.467262 Long: -79.148979

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [✓]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: Bedrock; Secondary sand/gravel/silt

	Width	
	at DP	Max
OHWM	28"	28"
Top of Bank	5'	6'

	Left	Right
Bank Slope (H:V)	1:1	2:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Chipmunk

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 286

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Deciduous forest

Left: Deciduous forest

Associated Wetland Present: Yes [ ] No [X]

If Yes, Describe:

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	R to L

Jurisdictional Connectivity Notes:

Connects with ST-A211(INT), a state classified stream (C, C)

Supplemental Notes & Comments:

Stream is sinuous with incised channels & high gradient stream

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A210
Data Point ID: DP-287 Date: 6/2/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jane Zinos
County: Chautauqua State: NY
Stream Name: Unknown
State Classified: Yes [X] No [ ] Not Applicable [ ]
If Yes, Classification: C, C
Lat: 42.461741 Long: -79.149329

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 2" Wetted Perimeter Width: 3'
Flow/Gradient Direction: W

Geomorphologic Characteristics

Primary Substrate Class: Bedrock/Boulder/Sand/Gravel/Cobble

	Width	
	at DP	Max
OHWM	8'	15'
Top of Bank	20.5'	25'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Portions eroded

Right Bank: Portions are raw and eroded

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Waterslippers, Megaloptera
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 287

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Deciduous forest

Left: Deciduous forest

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: WL - A337

Associated Artificial Drain Present: Yes [ ] No [Y]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	R to L

Jurisdictional Connectivity Notes:

Flows outside of delineation area

Supplemental Notes & Comments:

Incised channels, some eroded banks

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A211
Data Point ID: DP-288 Date: 6/3/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Gross
County: Chautauqua State: NY
Stream Name: UNT
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.467250 Long: -79.149374

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: Dry Wetted Perimeter Width: Dry
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: Gravel / Clay / Silt; Secondary Cobble

	Width	
	at DP	Max
OHWM	2.5'	2.5'
Top of Bank	5'	5'

	Left	Right
Bank Slope (H:V)	2:1	2:1

Bank Stability Summary

Left Bank: Moderately stable

Right Bank: Moderately stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 288

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Deciduous forest

Left: Deciduous forest

Associated Wetland Present: Yes [ ] No [X]

If Yes, Describe:

Associated Artificial Drain Present: Yes [X] No [ ]

If Yes, ID: AD - 209

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	R to L

Jurisdictional Connectivity Notes:

Connects to ST - A210, a state designated (C,T) stream

Supplemental Notes & Comments:

High gradient headwater stream. Leaf litter disturbance noted

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A212
Data Point ID: DP- 293 Date: 6/3/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Zuniga
County: Chautauqua State: NY
Stream Name: UNT
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.469657 Long: -79.149371

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: Dry Wetted Perimeter Width: Dry
Flow/Gradient Direction: West

Geomorphologic Characteristics

Primary Substrate Class: Sand / Gravel / Clay; Secondary cobble

	Width	
	at DP	Max
OHWM	2.5'	2.5'
Top of Bank	6'	6'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Relatively stable

Right Bank: Relatively stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 293

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Deciduous forest

Left: Deciduous forest

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: WL - A238 - Maintains hydrologic connectio

Associated Artificial Drain Present: Yes [X] No [ ]

If Yes, ID: AD - 211

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	R to L

Jurisdictional Connectivity Notes:

Flows into a state designated (C, L) stream outside of PSL. Stream was previously mapped as ST - A210 within another portion of the PSL

Supplemental Notes & Comments:

Stream commences at AD - 211 and has formed from WL - A238 drainage. Stream exhibits headcuts and leaf litter disturbance. High gradient headwater stream. Stream width ranges from 2' to 6'

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A213
Data Point ID: DP-294 Date: 6/3/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Jones
County: Chautauqua State: NY
Stream Name: UNT
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.469299 Long: -79.149667

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: moist channel Wetted Perimeter Width: moist channel
Flow/Gradient Direction: West

Geomorphologic Characteristics

Primary Substrate Class: Sand / Channel / Clay / Leaf-litter disturbance

	Width	
	at DP	Max
OHWM	2'	3'
Top of Bank	3'	4'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Toads / Chipmunks

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 994

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Deciduous forest

Left: Deciduous forest

Associated Wetland Present: Yes [ ] No [X]

If Yes, Describe:

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	R to L

Jurisdictional Connectivity Notes:

Connects to state designated (C, C) stream outside of PSL

Supplemental Notes & Comments:

Stream exhibits headcuts and leaf litter disturbance. High gradient headwater stream

STREAM FIELD ID: A500

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:	Date: 10/26/15
County: Chautauqua	State: New York
Evaluator(s): B. Virts, M. Bobergy	Data Point ID: DP-502

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction South

Width (ft) (water's edge to water's edge) 10'-12'

Width (ft) (bank to bank) 12'-14'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [ ] Silt/Clay
- [ ] Other Platey Substrate

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

4"- Riffles up to 2.5' in Pools

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[X]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[X]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion: Right and left Banks have alternating areas of stable and unstable banks. Vertical erosion is present in areas of instability

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list:

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: wetlands A500 and A501

Aquatic Organisms [X] yes [ ] no
If yes, list: Fish (trout)

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [X] Intermediate >10 ft, <100ft
- [ ] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

502 US/W

503 DS/E

504 RTC/N

STREAM FIELD ID: ST-A501

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 10/26/2015

County: Chautauqua

State: New York

Evaluator(s): M. Boberg B. Virts

Data Point ID: DP-504

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [ ] Perennial [X] Intermittent [ ] Ephemeral

Stream Flow Direction South

Width (ft) (water's edge to water's edge) 2'

Width (ft) (bank to bank) 4'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [X] Gravel
- [ ] Sand
- [ ] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
0-3' High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
3-6' High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[X]	51 - 100% (38-45°)	[X]
[ ]	100% (46°+)	[ ]
6' + High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Verticle banks with minor areas of erosion present.

Associated Habitat

Riparian Vegetation [X] yes [X] ~~no~~ BV
If yes, list: Facultative emergents

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [X] ~~no~~ BV
If yes, list ID: Wetland ~~WT~~-A502

Aquatic Organisms Wetland-A501 [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 506 US (N)

Photo 507 DS (S)

Photo 508 RTL (E)

* Stream is relocated as a roadside ditch.

STREAM FIELD ID: ST-A502

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 10/28/2015

County: Chautauqua

State: New York

Evaluator(s): M. BOBERG B. VIRTS

Data Point ID: DP-520

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction West

Width (ft) (water's edge to water's edge) 6'-8'

Width (ft) (bank to bank) 8'-12'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [ ] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[X]	21 - 50% (12-27°)	[X]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Localized erosion throughout reach.

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: mixed Hardwoods

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [X] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 525 (US) E

Photo 526 (DS) W

Photo 527 (RTL) S

STREAM FIELD ID: STREAM A503

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:

Date: 10/29/15

County: Chautauqua

State: New York

Evaluator(s): B. Viets, M. Boberg

Data Point ID: DP-522

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction EAST

Width (ft) (water's edge to water's edge) 4'

Width (ft) (bank to bank) 12'-15'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [ ] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion: STREAM channel is stable with little evidence of erosion

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: Facultative Herbaceous

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 539 WS/W

540 OS/E

541 RTL/N

STREAM FIELD ID: A504

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 10/29/15

County: Chautauqua

State: New York

Evaluator(s): B. Viets, M. Bobersky

Data Point ID: DP-525

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction South

Width (ft) (water's edge to water's edge) 15'

Width (ft) (bank to bank) 20'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [ ] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [ ] 7 - 12"
- [X] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[X]	51 - 100% (38-45°)	[X]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion: Visible erosion and bank undercutting on outside meander bends of channel

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: FACULTATIVE Herbaceous

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: WETLAND A513

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [X] Intermediate >10 ft, <100ft
- [ ] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

545 US / W

546 DS / E

547 LTR / S

STREAM FIELD ID: A505

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: Unnamed Tr. Bumary

Date: 10/29/15

County: Chautauqua

State: New York

Evaluator(s): B. Virts, M. Bobery

Data Point ID: DP-526

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction EAST

Width (ft) (water's edge to water's edge) 2'-3'

Width (ft) (bank to bank) 3'-5'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [X] Gravel
- [ ] Sand
- [ ] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[X]	21 - 50% (12-27°)	[X]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion: Stream is stable with little to no erosion present

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: FACULTATIVE emergents & Hemlock

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: WETland A514

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

548 US/W

549 DS/E

550 RTL/N

STREAM FIELD ID: A506

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: Unnamed Tributary

Date: 10/29/15

County: Chautauqua

State: New York

Evaluator(s): B. Virts, M. Boberg

Data Point ID: DP-527

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [ ] Perennial [X] Intermittent [ ] Ephemeral

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 1'-2'

Width (ft) (bank to bank) 2'-4'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [ ] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion: high gradient channel with minor areas of erosion

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: hemlock and Facultative herbs.

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: WETLAND A515

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

551 S/US

552 N/DS

553 W/RTC

STREAM FIELD ID: A508

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 10/30/15

County: Chautauqua

State: New York

Evaluator(s): B. Viets, M. Boberg

Data Point ID: DP532

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction South

Width (ft) (water's edge to water's edge) 4'-5'

Width (ft) (bank to bank) 5'-6'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [ ] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other _____

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
0-3' High		
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
3-6' High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
6' + High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Stream channel has little to no erosion at present.

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: willow overstory

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID:
Wetland A517

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms
[ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

561 US / N

562 DS / S

563 RTL / E

STREAM FIELD ID: ST-ASO7

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: Unnamed Tributary

Date: 11/03/2015

County: Chautauqua

State: New York

Evaluator(s): M. Bibeg S. Buckenmeyer

Data Point ID: DP-S47

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 6-8'

Width (ft) (bank to bank) 10-12'

Bottom Characteristics

Substrate Type:

- [X] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [ ] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[X]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[X]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

minor cutting under left bank

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: Mixed Hardwoods, Hemlock

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 579 US/W

Photo 580 DS/E

Photo 581 RTL/N

FISHER ASSOCIATES

STREAM FIELD ID: ST-AS11

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: ~~FD~~ 11/05/2015

County: Chautauqua

State: New York

Evaluator(s): M. Boberg S Buekenmuyer

Data Point ID: 573

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction South

Width (ft) (water's edge to water's edge) 2-5'

Width (ft) (bank to bank) 6-8'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [ ] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
0-3' High		
[X]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[X]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
3-6' High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
6' + High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

minor erosion on banks

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: mixed Hardwoods

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID:

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 611 US/N

Photo 612 DS/S

Photo 613 RTL/W

STREAM FIELD ID: ST-A512

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 11/05/2015

County: Chautauqua

State: New York

Evaluator(s): M. Boberg S. Buckenmeyer

Data Point ID: 574

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction South

Width (ft) (water's edge to water's edge) 2-4'

Width (ft) (bank to bank) 6-7'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [ ] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: mixed Hardwoods

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID:

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

~~ut4~~ Photo ut4 us/N

Photo ut5 DS/S

Photo ut6 RTL/W

STREAM FIELD ID: ST-A518

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 11/11/15

County: Chautauqua

State: New York

Evaluator(s): M. Boberg B. Virts

Data Point ID: 603

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 2-5'

Width (ft) (bank to bank) 5-6'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [ ] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

minor erosion to banks.

Associated Habitat

Riparian Vegetation [ ] yes [X] no
If yes, list:

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: WL-A562

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 602 US/S

Photo 603 DS/N

Photo 604 RTL/W

~~Photo~~

STREAM FIELD ID: A519

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:

Date: 11/12/2015

County: Chautauqua

State: New York

Evaluator(s): B. Virts, S. Buckenmeyer

Data Point ID: 608

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 2 foot

Width (ft) (bank to bank) 3-4 feet

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [X] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion: Minor erosion related to livestock access.

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: FACULTATIVE Emergent Herbacious species.

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [ ] yes [X] no
If yes, list: Not observed.

Riparian/Terrestrial Organisms [X] yes [ ] no
If yes, list: Cattle

T&E Species [ ] yes [X] no
If yes, list: None observed

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

670 W/US, 671 E/DS, 672 N/RTL

STREAM FIELD ID: A520

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name:

Date: 11/12/2015

County: Chautauqua

State: New York

Evaluator(s): B. Victs, S. Buckenmeyer

Data Point ID: 609

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction ~~North~~SB East

Width (ft) (water's edge to water's edge) 2-8 feet

Width (ft) (bank to bank) 4-10 feet

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [ ] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other _____

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion: Erosion from livestock. Severe stream instability in upper stream reach. Stable in the lower stream reach.

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: Facultative Emergent Herbaceous

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: A565

Aquatic Organisms [ ] yes [X] no
If yes, list: None observed

Riparian/Terrestrial Organisms [X] yes [ ] no
If yes, list: Cattle

T&E Species [ ] yes [X] no
If yes, list: None observed

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

673 W/US, 674 E/DS, 675 N/RTL

STREAM FIELD ID: A521

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: North Branch

Date: 11/12/15

County: Chautauqua

State: New York

Evaluator(s): B. Viets, S. Buckenmeyer

Data Point ID: 617 DP-627 BV ~~DP-627~~ (BV)

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction North

Width (ft) (water's edge to water's edge) Two channels 1° = 8', 2° = 6'

Width (ft) (bank to bank) 1° = 10'-12', 2° 8'-10'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [X] Cobble
- [X] Gravel
- [ ] Sand
- [ ] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
0-3' High		
[ ]	0 - 20% (0-11°)	[ ]
[X]	21 - 50% (12-27°)	[X]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
3-6' High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
6' + High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Erosion noted in local red areas. Both Primary and Secondary channels have head cutting upstream at their confluence

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: Forested + Herbaceous and shrubs

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: Wetland A567

Aquatic Organisms [ ] yes [X] no
If yes, list: none observed

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list: not observed

T&E Species [ ] yes [X] no
If yes, list: none observed

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

680 US / W

681 DS / E

682 RTL / N

STREAM FIELD ID: A522

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: UNNAMED TRIBUTARY

Date: 11/13/15

County: Chautauqua

State: New York

Evaluator(s): B. VIATS

Data Point ID: DP-619

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [ ] Perennial [X] Intermittent [ ] Ephemeral

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 2'

Width (ft) (bank to bank) 6'-8'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [X] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
0-3' High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[X]	51 - 100% + (38-45°)	[X]
[ ]	100%+(46°+)	[ ]
3-6' High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
6' + High		
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Channel is a high gradient stream that is impacted by cattle. The channel is generally unstable throughout the Reach

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: RT Bank Pasture LT Bank Apple Trees

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: Wetland A570

Aquatic Organisms [ ] yes [X] no
If yes, list: none observed

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list: none observed

T&E Species [ ] yes [X] no
If yes, list: none observed

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

620 - S/US

621 - N/DS

622 - W/RTL

STREAM FIELD ID: ST-A523

FISHER ASSOCIATES

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 11/10/2015

County: Chautauqua

State: New York

Evaluator(s): M. Boberg
S. Buckenmeyer

Data Point ID: DP-024

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 2 to 3 feet

Width (ft) (bank to bank) 2 to 4 feet

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [ ] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [X] 0 - 6"
- [ ] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

minor erosion

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: scrub shrub

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [X] yes [ ] no
If yes, list ID: WL-A578

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [ ] Intermediate >10 ft, <100ft
- [X] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 097 US/S

Photo 098 DS/N

Photo 099 RTL/E

FISHER ASSOCIATES

STREAM FIELD ID: ST-AS26

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 11/20/2015

County: Chautauqua

State: New York

Evaluator(s): M. Boberg S. Bickenmyer

Data Point ID: 0536

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction North

Width (ft) (water's edge to water's edge) 8-10'

Width (ft) (bank to bank) 15-20'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [ ] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

NO apparent erosion

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list:
FAC Emergent herbaceous

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [X] Intermediate >10 ft, <100ft
- [ ] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 736 US/S

Photo 737 DS/N

Photo 738 RTL/E

FISHER ASSOCIATES

STREAM FIELD ID: ST-A527

Project Name: Ball Hill Wind Project

Stream Name: unnamed Tributary

Date: 11/20/15

County: Chautauqua

State: New York

Evaluator(s): M. Boberg S. Buchenmyer

Data Point ID: 657

Stream Characteristics

Perceptible Flow [X] yes [ ] no

Flow Regime: [X] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction East

Width (ft) (water's edge to water's edge) 10-15

Width (ft) (bank to bank) 20-26'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [ ] Cobble
- [X] Gravel
- [ ] Sand
- [X] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [X] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[X]	0 - 20% (0-11°)	[X]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

No apparent erosion

Associated Habitat

Riparian Vegetation [X] yes [ ] no
If yes, list: mixed hardwoods

Aquatic Vegetation [ ] yes [X] no
If yes, list:

Associated Wetland [ ] yes [X] no
If yes, list ID:

Aquatic Organisms [ ] yes [X] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [X] no
If yes, list:

T&E Species [ ] yes [X] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [X] Intermediate >10 ft, <100ft
- [ ] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 739 US/W

Photo 740 DS/E

Photo 741 RTL/S

FISHER ASSOCIATES

STREAM FIELD ID: ST-AS28

Project Name: Ball Hill Wind Project

Stream Name: unnamed tributary

Date: 11/20/15

County: Chautauqua

State: New York

Evaluator(s): M. Boberg S. Buckenmeyer

Data Point ID: 058

Stream Characteristics

Perceptible Flow [x] yes [ ] no

Flow Regime: [x] Perennial [ ] Intermittent [ ] Ephemeral

Stream Flow Direction West

Width (ft) (water's edge to water's edge) 6-8'

Width (ft) (bank to bank) 8-10'

Bottom Characteristics

Substrate Type:

- [ ] Bedrock
- [x] Cobble
- [ ] Gravel
- [ ] Sand
- [x] Silt/Clay
- [ ] Other

Probed Stream Depth (if water present):

- [ ] 0 - 6"
- [x] 7 - 12"
- [ ] 13 - 24"
- [ ] 25 - 36"
- [ ] 37" +
- [ ] No Perceptible Depth

Bank Height and Slope

Left Bank*		Right Bank*
	0-3' High	
[x]	0 - 20% (0-11°)	[x]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% + (38-45°)	[ ]
[ ]	100%+(46°+)	[ ]
	3-6' High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]
	6' + High	
[ ]	0 - 20% (0-11°)	[ ]
[ ]	21 - 50% (12-27°)	[ ]
[ ]	51 - 100% (38-45°)	[ ]
[ ]	100% (46°+)	[ ]

Provide Detail of any Evidence of Erosion:

Minor erosion on banks evidence of recent flood downstream

Associated Habitat

Riparian Vegetation [x] yes [ ] no
If yes, list: mixed Hardwoods

Aquatic Vegetation [ ] yes [x] no
If yes, list:

Associated Wetland [ ] yes [x] no
If yes, list ID:

Aquatic Organisms [ ] yes [x] no
If yes, list:

Riparian/Terrestrial Organisms [ ] yes [x] no
If yes, list:

T&E Species [ ] yes [x] no
If yes, list:

Size Class

- [ ] Major >100 ft
- [x] Intermediate >10 ft, <100ft
- [x] Minor <10 ft

Stream Photos Collected ID, Direction, and Description:

Photo 743 US/E

Photo 744 DS/W

Photo 745 RTL/S

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: Stream AS29
Data Point ID: DP-6666 Date: 5/20/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Wirts, Nicole Dutcher
County: Chautauqua State: NY
Stream Name: Unnamed trib to Branch Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.407665 Long: -79.114551

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 4" Wetted Perimeter Width: 1.0'
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: Silt/Clay

	Width	
	at DP	Max
OHWM	5.0'	5.0'
Top of Bank	10.0'	10.0'

	Left	Right
Bank Slope (H:V)	3/2.5	3/2.5

Bank Stability Summary

Left Bank: No areas of bank instability / fully vegetated

Right Bank: No areas of bank instability / fully vegetated

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 0606

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-2' - FAC/Emergent veg.
2'-150' - Cultivated row crops (wheat)

Left: 0-5' - FAC/Emergent veg
5'-150' - Cultivated row crops (wheat)

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: Wetland A597

Associated Artificial Drain Present: Yes [X] No [ ]

If Yes, ID: AD-A510

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	RTL

Jurisdictional Connectivity Notes:

Recieves hydrology from gradient wetland and discharges to unnamed tributary of Branch Creek

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-AS30
Data Point ID: DP-667 Date: 5/23/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Wirts and Nicole Dutcher
County: Chautauqua State: NY
Stream Name: Unnamed trib to Branch Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.408745 Long: -79.110409

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 2in Wetted Perimeter Width: 4ft
Flow/Gradient Direction: East

Geomorphologic Characteristics

Primary Substrate Class: Silt/Clay

	Width	
	at DP	Max
OHWM	5ft	5ft
Top of Bank	8ft	10ft

	Left	Right
Bank Slope (H:V)	3/4	1/0.5

Bank Stability Summary

Left Bank: Moderate erosion w/in channel, more severe @ outside meander bends
Right Bank: Minor erosion, stream has good access to flood plain

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 6067

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Hardwood forest w/ selective timberharvest (beech)

Left: 0-80 + 90-150 : Hardwood forest

80-90 : dirt access road

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: Wetland A598

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	RTL

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: STREAM A531
Data Point ID: DP-685 Date: 5/24/16
Project Name: Ball Hill Wind Project
Evaluator(s): B. Vieths
County: Chautauqua State: NY
Stream Name: Unnamed tributary of Silver Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.433901 Long: -79.130705

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 2"-4" Wetted Perimeter Width: 4'
Flow/Gradient Direction: EAST

Geomorphologic Characteristics

Primary Substrate Class: Gravel

	Width	
	at DP	Max
OHWM	7'	16'
Top of Bank	12'	18'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Bank is stable with very minor examples of ~~erosion~~ erosion present
Right Bank: Bank is stable with very minor examples of ~~erosion~~ erosion present

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Minnows
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 685

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0'-150' Hardwood Forest - mature hemlocks

Left: 0'-150' Hardwood Forest - mature hemlocks

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: Wetland A608

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	W	
Dowsnstream	E	
Cross Channel	N	RTL

Jurisdictional Connectivity Notes:

Tributary of Silver Creek

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: Stream A532
Data Point ID: DP- 686 Date: 5/24/16
Project Name: Ball Hill Wind Project
Evaluator(s): B. Viets
County: Chautauqua State: NY
Stream Name: unnamed tributary of Silver Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.434037 Long: -79.130850

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 4" Wetted Perimeter Width: 4'
Flow/Gradient Direction: East

Geomorphologic Characteristics

Primary Substrate Class: Gravel

	Width	
	at DP	Max
OHWM	6'	8'
Top of Bank	8'	10'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Bank stable, no erosion present

Right Bank: Bank stable, no erosion present

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 686

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0'-150' Mature Hemlock Forest

Left: 0'-150' mature Hemlock Forest

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: Wetland A608

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	W	
Dowsnstream	E	
Cross Channel	N	RTL

Jurisdictional Connectivity Notes:

Tributary of Silver Creek

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: Stream AS33
Data Point ID: DP- 707 Date: 5/26/16
Project Name: Ball Hill Wind Project
Evaluator(s): B. Viers, S. Buckenmeyer
County: Chautauqua State: NY
Stream Name: Silver Creek
State Classified: Yes [x] No [ ] Not Applicable [ ]
If Yes, Classification: A
Lat: 42.451881 Long: -79.103028

Hydrologic Characteristics

Flow Regime: Perennial [x] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [x] Absent [ ]
Perceptible Flow: Present [x] Absent [ ]
Water Depth at Thalweg: .05' Wetted Perimeter Width: 7'
Flow/Gradient Direction: East

Geomorphologic Characteristics

Primary Substrate Class: Gravel (Large)

	Width	
	at DP	Max
OHWM	21'	30'
Top of Bank	23'	30'

	Left	Right
Bank Slope (H:V)	2:1	2:1

Bank Stability Summary

Left Bank: minor Bank erosion with Significant Disturbance near stream crossing
Right Bank: minor Bank erosion with Significant Disturbance near stream crossing

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [x]
If Yes, Describe:
Aquatic Organisms Observed: Yes [x] No [ ]
If Yes, Describe: Caddis Fly, Stonefly, Mayfly, Red backed Salamander, minnows
Terrestrial Organisms Observed: Yes [ ] No [x]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 707

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Forested and shrub Riparian 0'-150'

Left: Forested and shrub Riparian Species 0'-150'

Associated Wetland Present: Yes [ ] No [X]

If Yes, Describe:

Associated Artificial Drain Present: Yes [X] No [ ]

If Yes, ID: AD-514

Photos

	Direction	Notes/Additional Description
Upstream	W	
Dowsnstream	E	
Cross Channel	N	RTL

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

Stream appears to have Regular maintenance dredging upstream of the culvert crossing and has a large concrete apron within the stream downgradient of the culvert crossing.

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: STREAM A534
Data Point ID: DP- 712 Date: 5/26/16
Project Name: Ball Hill Wind Project
Evaluator(s): B. Virts, S. Buckenmeyer
County: Chautauqua State: NY
Stream Name: Unnamed Tributary of Silver Creek
State Classified: Yes [X] No [ ] Not Applicable [ ]
If Yes, Classification: A
Lat: 42.456515 Long: -79.104645

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 6" Wetted Perimeter Width: 7'
Flow/Gradient Direction: EAST

Geomorphologic Characteristics

Primary Substrate Class: Gravel / Cobble

	Width	
	at DP	Max
OHWM	13'	15'
Top of Bank	9'	25'

	Left	Right
Bank Slope (H:V)	2:2.5'	2':5'

Bank Stability Summary

Left Bank: Left bank is stable upstream of existing culvert and unstable/incised below
Right Bank: Right Bank is stable upstream of existing culvert and unstable/incised below

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Caddis flies, Stone flies
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP-712

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0'-25' shrub riparian species vegetation and 75'-150' hay field

Left: 0'-75' shrub and forest buffer area with an area mowed for beehives, 75'-150' hay field

Associated Wetland Present: Yes [ ] No [X]

If Yes, Describe:

Associated Artificial Drain Present: Yes [X] No [ ]

If Yes, ID: AD-517

Photos

	Direction	Notes/Additional Description
Upstream	W	
Dowsnstream	E	
Cross Channel	N	RTL

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: STREAM A535
Data Point ID: DP- 719 Date: 5/27/16
Project Name: Ball Hill Wind Project
Evaluator(s): B. VIRTS N. Dutcher
County: Chautauqua State: NY
Stream Name: U.T. of Silver Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.439573 Long: -79.130699

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 46" Wetted Perimeter Width: 1'
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: Silt

	Width	
	at DP	Max
OHWM	2'	3'
Top of Bank	4'	5'

	Left	Right
Bank Slope (H:V)	6":5'	6":5'

Bank Stability Summary

Left Bank: Bank is vegetated and very stable

Right Bank: Bank is vegetated and very stable

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP - 719

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: within Power ROW - herbaceous FACultative and wetter plants within forest, shrub and tree species

Left: ↓

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: Wetland A623 (PFO, PEM within ROW)

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	RTL

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: Stream A537
Data Point ID: DP-747 Date: 6/8/16
Project Name: Ball Hill Wind Project
Evaluator(s): B. Viers, N. Dutcher
County: Chautauqua State: NY
Stream Name: U.T. of Silver Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.437886 Long: -79.121326

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg (ft.): 26"
Wetted Perimeter Width (ft.): 2'
Flow/Gradient Direction: East / Northeast

Geomorphologic Characteristics

Primary Substrate Class: Gravel | Silt

	Width (ft.)	
	at DP	Max
OHWM	2'	5'
Top of Bank	4'	12'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1' : 2.5'
Right: 1' : 2.5'

Bank Stability Summary

Right: Stream banks are heavily impacted by livestock, have vertical eroding banks, and are nearly void of vegetation

Left: Both left and Right banks are very unstable throughout the reach

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP-747

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0'-150' Actively grazed Pasture

Left: 0'-50' Actively grazed pasture
50'-70' Dirt Access Road
70'-150' Actively grazed Pasture

Associated Wetland Present: Yes [X] No [ ]
If Yes, ID: Wetland A635

Associated Artificial Drain Present: Yes [X] No [ ]
If Yes, ID: AD-521

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	RTL

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A538
Data Point ID: DP-750 Date: 6/8/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Lints and Nicole Dutcher
County: Chautauqua State: NY
Stream Name: Unnamed tributary to Silver Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.44 7305 Long: -79.122743

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent [ ] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: 4" Wetted Perimeter Width: 2'
Flow/Gradient Direction: East

Geomorphologic Characteristics

Primary Substrate Class: silt | gravel | cobbles

	Width	
	at DP	Max
OHWM	7'	8'
Top of Bank	9'	10'

	Left	Right
Bank Slope (H:V)	2:1	2:1

Bank Stability Summary

Left Bank: Moderately stable, some ferns stabilizing bank but some erosion during highflow periods
Right Bank: ↑ Same

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:
Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:
Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP-750

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-10' Floodplain wetland
10-150' Upland mixed deciduous/coniferous forest with understory

Left: 0-5' Floodplain wetland
5'-150' Upland mixed deciduous/coniferous forest w/ understory

Associated Wetland Present: Yes [X] No [ ]

If Yes, Describe: Wetland A548

Associated Artificial Drain Present: Yes [ ] No [X]

If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	W	
Dowsnstream	E	
Cross Channel	N	R to L

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

Stream starts within wetland A548 and is outlet for groundwater discharge (water present year round).

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A539
Data Point ID: DP-761 Date: 6/9/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Wits and Nick Duthy
County: Chautauqua State: NY
Stream Name: U.T. of Walnut Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.478907 Long: -79.149567

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): N/A
Wetted Perimeter Width (ft.): N/A
Flow/Gradient Direction: Northwest

Geomorphologic Characteristics

Primary Substrate Class: Silt Some Cobbles

	Width (ft.)	
	at DP	Max
OHWM	N/A	N/A
Top of Bank	3'	6'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:1
Right: 1:1

Bank Stability Summary

Right: Somewhat stable, some roots but evidence of erosion and undercutting during high flow

Left: Same as above ↑

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP-761

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-150' : Deciduous Forest / Secondary growth, no shrub/scrub layer, little herbaceous layer

Left: 0-80' Deciduous / Secondary growth forest, little understory
80-150' - Cultivated / mowed hay field

Associated Wetland Present: Yes [ ] No [X]
If Yes, ID:

Associated Artificial Drain Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	R Toe

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: Stream ST-A540
Data Point ID: DP- 7602 Date: 10/9/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Virts and Nicole Dutcher
County: Chautauqua State: NY
Stream Name: UT. of Walnut Creek
State Classified: Yes ☐ No ☐ Not Applicable ☐
If Yes, Classification:
Lat: 42.479320 Long: -79.149120

Hydrologic Characteristics

Flow Regime: Perennial [X] Intermittent ☐ Ephermeral ☐
Surface Water: Present [X] Absent ☐
Perceptible Flow: Present [X] Absent ☐
Water Depth at Thalweg (ft.): 3"
Wetted Perimeter Width (ft.): 6"
Flow/Gradient Direction: West

Geomorphologic Characteristics

Primary Substrate Class: Bedrock

	Width (ft.)	
	at DP	Max
OHWM	3'	6'
Top of Bank	20'	40'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 90%
Right: 90%

Bank Stability Summary

Right: Moderately stable, deep channel and very steep drop off but being held up by bedrock layers and most of trees growing on edge of top of bank and on sides of bank
Left: Same as right side ↑

FISHER ASSOCIATES

Stream Data Form

Data Point ID: 762

Habitat Characteristics

Aquatic Vegetation Present: Yes ☐ No ☒
If Yes, Describe:

Aquatic Organisms Observed: Yes ☐ No ☐
If Yes, Describe:

Terrestrial Organisms Observed: Yes ☒ No ☐
If Yes, Describe: Birds

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0'-150' - Upland deciduous forest a few conifers, little understory and ground cover

Left: 0'-150' - Upland deciduous forest a few conifers (Hemlock) mixed in, little understory and ground cover

Associated Wetland Present: Yes ☐ No ☒
If Yes, ID:

Associated Artificial Drain Present: Yes ☐ No ☒
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	RTL

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

- Very large, perenial channel with some upland islands throughout.
During flood events water scours bedrock on banks.
- Stream has eroded large area, bank is about 20' wide but gorge/ravine area is a total of about 60' including floodplain
- 90° bank slope at data point, slope turns into more of 45° slope up and down stream of data point but bank vertical height is still about 20'-30' 2
- about 60' drop just ~~outside~~ about 10' inside of study area, w/ waterfall

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-AS41
Data Point ID: DP-765 Date: 6/9/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Virts and Nicole Dutcher
County: Chautauqua State: NY
Stream Name: U.T. of Walnut Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.481276 Long: -79.149353

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): N/A
Wetted Perimeter Width (ft.): N/A
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: silt, gravel, cobble

	Width (ft.)	
	at DP	Max
OHWM	~~10~~ 6'	7'
Top of Bank	7'	9'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:1
Right: 1:1

Bank Stability Summary

Right: evidence of erosion, sloughing and undercutting at meander points, little ground + tree vegetation to stabilize bank
Left: Same as above

FISHER ASSOCIATES

Stream Data Form

Data Point ID: 765

Habitat Characteristics

Aquatic Vegetation Present: Yes ☐ No ☒
If Yes, Describe:

Aquatic Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Terrestrial Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-150' - Upland deciduous secondary growth forest - mostly Acer Saccharum

Left: 0-150' - Upland mixed conifers (E. Hemlock) and deciduous (Yellow Birch)

Associated Wetland Present: Yes ☐ No ☒
If Yes, ID:

Associated Artificial Drain Present: Yes ☐ No ☒
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	RTDL

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A542
Data Point ID: DP-7606 Date: 6/9/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Virts and Nicole Durcher
County: Chautauqua State: NY
Stream Name: U.T. of Walnut Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.482581 Long: -79.149368

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): N/A
Wetted Perimeter Width (ft.): N/A
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: Silt | rock

	Width (ft.)	
	at DP	Max
OHWM	3'	3'
Top of Bank	5'	7'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:1
Right: 1:1

Bank Stability Summary

Right: Stable at datapoint and upstream, becomes very steep / large vertical banks downstream and off site.

Left: Same as above ↑

FISHER ASSOCIATES

Stream Data Form

Data Point ID: 7ele

Habitat Characteristics

Aquatic Vegetation Present: Yes ☐ No ☒
If Yes, Describe:

Aquatic Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Terrestrial Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-150' - Deciduous hardwood forest, Sugar maple, yellow birch and shag bark hickory

Left: Same as above ↑

Associated Wetland Present: Yes ☐ No ☒
If Yes, ID:

Associated Artificial Drain Present: Yes ☐ No ☒
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	E	R to L

Jurisdictional Connectivity Notes:

Ephemeral stream within study area, turns into intermittent Channel off-site, & flowing toward stream A540.

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: ST-A543
Data Point ID: DP-767 Date: 6/10/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Vitts and Nicole Dutcher
County: Chautauqua State: NY
Stream Name: Unnamed Tributary of Walnut Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.483904 Long: -79.149354

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): N/A
Wetted Perimeter Width (ft.): N/A
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: Rock

	Width (ft.)	
	at DP	Max
OHWM	4'	5'
Top of Bank	6'	10'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:1
Right: 1:1

Bank Stability Summary

Right: Slightly Stable, bedrock and roots holding it up but major scouring and undercutting at meandering points

Left: Same as above.

FISHER ASSOCIATES

Stream Data Form

Data Point ID: 767

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Birds, Chipmonks

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-150' - Deciduous hardwood forest, about 80% canopy cover w/ little understory and ground cover

Left: Same as above ↑ Steep slope up starting around 100'

Associated Wetland Present: Yes [ ] No [X]
If Yes, ID:

Associated Artificial Drain Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	R n L

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

Deep channel up stream, alluvial fans where major turns are w/ large sediment deposit

About 3 (sinuousity) bends in 100'

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: AS44
Data Point ID: DP- 770 Date: 6/10/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Viets and Nick Dutcher
County: Chautauqua State: NY
Stream Name: Unnamed Tributary of Walnut Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.484673 Long: -79.149581

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [ ] Ephermeral [X]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): N/A
Wetted Perimeter Width (ft.): N/A
Flow/Gradient Direction: West

Geomorphologic Characteristics

Primary Substrate Class: Silt

	Width (ft.)	
	at DP	Max
OHWM	1'	2'
Top of Bank	2'	3'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:1
Right: 1:1

Bank Stability Summary

Right: Very steep, bank slope about 45% with not a high bank, bank stabilized by herbaceous vegetation

Left: Same as above ↑

FISHER ASSOCIATES

Stream Data Form

Data Point ID: 770

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Birds, chipmunks

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-150' Deciduous hardwood Forest, with little shrub/sapling layer but 60% ground cover

Left: Same as above ↑

Associated Wetland Present: Yes [X] No [ ]
If Yes, ID: A640

Associated Artificial Drain Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	R to L

Jurisdictional Connectivity Notes:

Ephemeral drain runs to wetland A640 that then drains off site to ditch along railroad which offsite most likely drains to perennial stream to the west.

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: A545
Data Point ID: DP-771 Date: 6/10/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Virts and Nicole Dutcher
County: Chautauqua State: NY
Stream Name: Unnamed tributary of Walnut Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.485990 Long: -79.149661

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): 6" (0.5ft)
Wetted Perimeter Width (ft.): 3'
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: Silt/cobbles/gravel

	Width (ft.)	
	at DP	Max
OHWM	3'	4'
Top of Bank	4'	6'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:2
Right: 1:3

Bank Stability Summary

Right: Moderately stable, some erosion due to bank slope and height, no real herbaceous veg holding substrate evidence of undercutting at meander points
Left:

FISHER ASSOCIATES

Stream Data Form

Data Point ID: 771

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Birds + chipmunks

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: 0'-150' - Deciduous hardwood forest

Left: 0'-150' - Deciduous hardwood forest

Associated Wetland Present: Yes [ ] No [X]
If Yes, ID:

Associated Artificial Drain Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	R to L

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

Ephemeral upstream from datapoint and intermittent downstream

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: A546
Data Point ID: DP-772 Date: 6/10/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Virts and Nicole Dutcher
County: Chautauqua State: NY
Stream Name: Unnamed tributary of Walnut Creek
State Classified: Yes [ ] No [X] Not Applicable [ ]
If Yes, Classification:
Lat: 42.487339 Long: -79.149348

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): 0.25'
Wetted Perimeter Width (ft.): 2'
Flow/Gradient Direction: North

Geomorphologic Characteristics

Primary Substrate Class: Silt/Clay + cobbles/gravel

	Width (ft.)	
	at DP	Max
OHWM	4'	6'
Top of Bank	5'	8'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:3
Right: 1:3

Bank Stability Summary

Right: Moderately stable, mostly rock layers and some roots preventing erosion, serious undercutting @ meander points due to steep gradient
Left: Same as above

FISHER ASSOCIATES

Stream Data Form

Data Point ID: 772

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [X] No [ ]
If Yes, Describe: birds

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: Deciduous hardwood forest

Left: Deciduous hardwood forest

Associated Wetland Present: Yes [X] No [ ]
If Yes, ID: A 641

Associated Artificial Drain Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	RBL

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

FISHER ASSOCIATES

Stream Data Form

Stream Field ID: STREAM A547
Data Point ID: DP-781 Date: 6/22/16
Project Name: Ball Hill Wind Project
Evaluator(s): B. Virts, J. Scuderi
County: Chautauqua State: NY
Stream Name: U.T. of Silver Creek
State Classified: Yes [X] No [ ] Not Applicable [ ]
If Yes, Classification: C
Lat: 42.5083579 Long: -79.1580228

Hydrologic Characteristics

Flow Regime: Perennial [ ] Intermittent [X] Ephermeral [ ]
Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): NA
Wetted Perimeter Width (ft.): NA
Flow/Gradient Direction: South

Geomorphologic Characteristics

Primary Substrate Class: Silt/clay

	Width (ft.)	
	at DP	Max
OHWM	5'	6'
Top of Bank	11'	13'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 3:2
Right: 3:2

Bank Stability Summary

Right: Bank is fully vegetated and stable.

Left: Same as Right Bank

FISHER ASSOCIATES

Stream Data Form

Data Point ID: DP-781

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0'-5' FACultative and facultative wet shrubs and herbaceous layers
5'-150' cultivated vineyard

Left: Same as Right Bank

Associated Wetland Present: Yes [X] No [ ]
If Yes, ID: Wetland A593 connects to stream offsite

Associated Artificial Drain Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Notes/Additional Description
Upstream	N	
Dowsnstream	S	
Cross Channel	E	LTR

Jurisdictional Connectivity Notes:

Supplemental Notes & Comments:

APPENDIX C
DITCH DATA FORMS

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DT-A200
Data Point ID: DP-223 Date: 5/24/16
Project Name: Ball Hill Wind Project
Evaluator(s): J. Zelos
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.420247 Long: -79.135834

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
X		a) Presence of Relatively Permanent Flowing or Standing Water
		b) A Natural Stream That Has Been Altered
		c) Excavated in a Jurisdictional WOTUS
		d) Connects Two or More Jurisdictional WOTUS
		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: South

Geomorphologic Characteristics

Primary Substrate Class:

	Width	
	at DP	Max
OHWM	2.5'	2.5
Top of Bank	3'	4.5'

	Left	Right
Bank Slope (H:V)	1:3	1:3

Bank Stability Summary

Left Bank: Not stabalized

Right Bank: Not stabalized

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP- 223

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: Phalaris arundinacea, Yellow rocket, Trifolium repens, Taraxacum officinale
Left: Dactylis glomerata, Taraxacum officinale

Associated Wetland Present: Yes [ ] No [ ]
If Yes, Describe:

Associated Artificial Drain(s) Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Description
Upstream	N	
Dowsnstream	S	
Cross Channel	W	L to R

Supplemental Notes & Comments:

Ditch is cut through an agricultural field to drain adjacent hay fields. Connects with ST-A202. Relatively defined channel 90HWM.

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: Ditch-G1
Data Point ID: DP- 237 Date: 5/25/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Zanos
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.410551 Long: -79.164061

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
X		a) Presence of Relatively Permanent Flowing or Standing Water
		b) A Natural Stream That Has Been Altered
		c) Excavated in a Jurisdictional WOTUS
		d) Connects Two or More Jurisdictional WOTUS
X		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 1" Wetted Perimeter Width: 16-20"
Flow/Gradient Direction: N

Geomorphologic Characteristics

Primary Substrate Class:

	Width	
	at DP	Max
OHWM	7'	7'
Top of Bank	9'	9'

	Left	Right
Bank Slope (H:V)	1:3	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP- 237

Habitat Characteristics

Aquatic Vegetation Present: Yes [X] No [ ]
If Yes, Describe: scattered J. latifolia (<1%) and C. arvense (1%)

Aquatic Organisms Observed: Yes [X] No [ ]
If Yes, Describe: Tadpoles

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: P. lanceolata, D. glomerata, J. effusus

Left: autumn olive, R. acris, D. glomerata

Associated Wetland Present: Yes [X] No [ ]
If Yes, Describe: Wetland 01 to south

Associated Artificial Drain(s) Present: Yes [X] No [ ]
If Yes, ID: Culvert 200

Photos

	Direction	Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	R to L bank

Supplemental Notes & Comments:

Extension of previously delineated ditch into new research area

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DT-A201
Data Point ID: DP-251 Date: 5/26/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Zuros
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.393015 Long: -79.141955

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
X		a) Presence of Relatively Permanent Flowing or Standing Water
		b) A Natural Stream That Has Been Altered
		c) Excavated in a Jurisdictional WOTUS
		d) Connects Two or More Jurisdictional WOTUS
		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: N

Geomorphologic Characteristics

Primary Substrate Class: Clay / Sand / Gravel / cobble

	Width	
	at DP	Max
OHWM	1'	1'
Top of Bank	27"	27"

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP- 251

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: A. saccharum, T. canadensis, P. alleghenensis

Left: Same

Associated Wetland Present: Yes [ ] No [X]
If Yes, Describe:

Associated Artificial Drain(s) Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Description
Upstream	W	
Dowsnstream	E	
Cross Channel	N	R to L

Supplemental Notes & Comments:

Flows into ST-A204

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DT-E1 EXT
Data Point ID: DP-264 Date: 5/31/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Bruce
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.407138 Long: -79.139979

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
X		a) Presence of Relatively Permanent Flowing or Standing Water
		b) A Natural Stream That Has Been Altered
		c) Excavated in a Jurisdictional WOTUS
		d) Connects Two or More Jurisdictional WOTUS
		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: S

Geomorphologic Characteristics

Primary Substrate Class:

	Width	
	at DP	Max
OHWM	13	21
Top of Bank	26	31

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Relatively stable

Right Bank: Relatively stable

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP- 264

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: WL - IY & fallow corn field

Left: Roadway & fallow field / Residential

Associated Wetland Present: Yes [ ] No [X]
If Yes, Describe:

Associated Artificial Drain(s) Present: Yes [X] No [ ]
If Yes, ID:

Photos

	Direction	Description
Upstream	N	
Dowsnstream	S	
Cross Channel	E	R to L

Supplemental Notes & Comments:

Channel is dry from below normal precipitation. Flows into a stream outside of delineation area

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DT-A201
Data Point ID: DP- 280 Date: 6/1/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Zinos
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.452183 Long: -79.112629

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
X		a) Presence of Relatively Permanent Flowing or Standing Water
		b) A Natural Stream That Has Been Altered
		c) Excavated in a Jurisdictional WOTUS
		d) Connects Two or More Jurisdictional WOTUS
		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: S

Geomorphologic Characteristics

Primary Substrate Class:

	Width	
	at DP	Max
OHWM	1'	1'
Top of Bank	1.5'	1.5'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP- 280

Habitat Characteristics

Aquatic Vegetation Present: Yes ☐ No ☑
If Yes, Describe:

Aquatic Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Terrestrial Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: Emergent forest

Left: Scrub

Associated Wetland Present: Yes ☒ No ☐
If Yes, Describe: Outside of searchare

Associated Artificial Drain(s) Present: Yes ☐ No ☒
If Yes, ID:

Photos

	Direction	Description
Upstream	N	
Dowsnstream	S	
Cross Channel	W	L to R

Supplemental Notes & Comments:

Drains agricultural field to a wetland and state mapped stream outside of delineation area.

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DT-A203
Data Point ID: DP-287 Date: 6/2/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Davis
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.460326 Long: -79.148835

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
X		a) Presence of Relatively Permanent Flowing or Standing Water
		b) A Natural Stream That Has Been Altered
		c) Excavated in a Jurisdictional WOTUS
		d) Connects Two or More Jurisdictional WOTUS
		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [X] Absent [ ]
Water Depth at Thalweg: 2" Wetted Perimeter Width: 30"
Flow/Gradient Direction: West

Geomorphologic Characteristics

Primary Substrate Class: Concrete

	Width	
	at DP	Max
OHWM	30"	30"
Top of Bank	41"	41"

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP- 382

Habitat Characteristics

Aquatic Vegetation Present: Yes [X] No [ ]
If Yes, Describe: P. amerisis J. latifolia

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: Rt 39, shrub field

Left: 9d crop field

Associated Wetland Present: Yes [ ] No [X]
If Yes, Describe:

Associated Artificial Drain(s) Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Description
Upstream	E	
Dowsnstream	W	
Cross Channel	N	R to L

Supplemental Notes & Comments:

Ditch parallels Rt. 39. Most of the area located within the delineation area is comprised of concrete. Ditch likely connects to a WOTUS and would be considered jurisdictional. Water levels are down and flow is stagnant

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DT-A304
Data Point ID: DP- 283 Date: 6/2/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Zuros
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.460459 Long: -79.148818

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
X		a) Presence of Relatively Permanent Flowing or Standing Water
		b) A Natural Stream That Has Been Altered
		c) Excavated in a Jurisdictional WOTUS
		d) Connects Two or More Jurisdictional WOTUS
		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: W

Geomorphologic Characteristics

Primary Substrate Class: Concrete

	Width	
	at DP	Max
OHWM	1'	1'
Top of Bank	42"	42"

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP-283

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [✓]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [✓]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: Shrubby field

Left: Rt 39, DT-A203, a hayfield

Associated Wetland Present: Yes [ ] No [X]
If Yes, Describe:

Associated Artificial Drain(s) Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Description
Upstream	E	
Dowsnstream	W	
Cross Channel	N	L to R

Supplemental Notes & Comments:

Ditch is concrete within delineation area upstream and downstream extents are unknown. Given location the ditch likely connects or drains a WOTUS.

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DI-A205
Data Point ID: DP- 284 Date: 6/2/16
Project Name: Ball Hill Wind Project
Evaluator(s): Jaime Bonas
County: Chautauqua State: NY
Jurisdictional: Yes [✓] No [ ]
Lat: 42.463673 Long: -79.149544

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
✓		1) Defined Bed and Bank Present
✓		2) Ordinary High Water Mark Present
✓		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
✓		a) Presence of Relatively Permanent Flowing or Standing Water
		b) A Natural Stream That Has Been Altered
		c) Excavated in a Jurisdictional WOTUS
		d) Connects Two or More Jurisdictional WOTUS
		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [✓]
Perceptible Flow: Present [ ] Absent [✓]
Water Depth at Thalweg: N/A Wetted Perimeter Width: N/A
Flow/Gradient Direction: W

Geomorphologic Characteristics

Primary Substrate Class:

	Width	
	at DP	Max
OHWM	21"	21"
Top of Bank	4.5'	4.5'

	Left	Right
Bank Slope (H:V)	1:1	1:1

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP- 384

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: Hoppe Road, Single family Residential, ag fields

Left: Shrub-Scrub, Single family residential.

Associated Wetland Present: Yes [ ] No [X]
If Yes, Describe:

Associated Artificial Drain(s) Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	A to L

Supplemental Notes & Comments:

Ditch likely flows into a WOTUS and flows a WOTUS and is considered to be jurisdictional

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: 1 - Ditch-A591
Data Point ID: DP-065 Date: 5/20/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Virts, Nicole Dutcher
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.407788 Long: -79.113959

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
	X	3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
X		a) Presence of Relatively Permanent Flowing or Standing Water
	X	b) A Natural Stream That Has Been Altered
	X	c) Excavated in a Jurisdictional WOTUS
	X	d) Connects Two or More Jurisdictional WOTUS
	X	e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [X] Absent [ ]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: 3" Wetted Perimeter Width: 1.0'
Flow/Gradient Direction: 10% N

Geomorphologic Characteristics

Primary Substrate Class: Silt / Clay

	Width	
	at DP	Max
OHWM	4.0'	6.0'
Top of Bank	9.0'	12.0'

	Left	Right
Bank Slope (H:V)	2' / 3'	2' : 3'

Bank Stability Summary

Left Bank: bank is stable, no erosion present

Right Bank: bank is stable, no erosion present

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP-U65

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-5' Maintained FAC herbacious
5'-150' Cultivated row crops (wheat)

Left: 0-40' FAC/FACW herbacious veg.
40'-50' Access road
50'-150' Cultivated row crops (wheat)

Associated Wetland Present: Yes [X] No [ ]
If Yes, Describe: Wetland A597

Associated Artificial Drain(s) Present: Yes [X] No [ ]
If Yes, ID: AD-A509

Photos

	Direction	Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	RTL

Supplemental Notes & Comments:

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: Ditch A50w
Data Point ID: DP-720 Date: 5/27/16
Project Name: Ball Hill
Evaluator(s): Ben Virts and Nicole Dutcher
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.439850 Long: -79.129355

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
	X	a) Presence of Relatively Permanent Flowing or Standing Water
	X	b) A Natural Stream That Has Been Altered
X		c) Excavated in a Jurisdictional WOTUS
	X	d) Connects Two or More Jurisdictional WOTUS
	X	e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg: N/A Wetted Perimeter Width: ____
Flow/Gradient Direction: East

Geomorphologic Characteristics

Primary Substrate Class: Silt

	Width	
	at DP	Max
OHWM	1.5ft	2.5ft
Top of Bank	2 ft	3 ft

	Left	Right
Bank Slope (H:V)	0.5/0.5	1/0.5

Bank Stability Summary

Left Bank: Stable

Right Bank: Stable

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP-720

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):
Right: 0-3' herbacuous cover
3-100' Road, 100-150' Upland/
Left: 0-150' PSS wetland WL-A624

Associated Wetland Present: Yes [X] No [ ]
If Yes, Describe: Wetland WL-A624

Associated Artificial Drain(s) Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Description
Upstream	W	
Dowsnstream	E	
Cross Channel	N	L to R

Supplemental Notes & Comments:

Road side ditch dug in original boundary of wetlands.

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DI-A507
Data Point ID: DP-754 Date: 6/8/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Viers and Nicole Dutcher
County: Chautauqua State: NY
Jurisdictional: Yes [ ] No [X]
Lat: 42.419441 Long: -79.152273

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
	X	2) Ordinary High Water Mark Present
	X	3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
	X	a) Presence of Relatively Permanent Flowing or Standing Water
	X	b) A Natural Stream That Has Been Altered
	X	c) Excavated in a Jurisdictional WOTUS
	X	d) Connects Two or More Jurisdictional WOTUS
	X	e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): N/A
Wetted Perimeter Width (ft.): N/A
Flow/Gradient Direction:

Geomorphologic Characteristics

Primary Substrate Class: Silt

	Width (ft.)	
	at DP	Max
OHWM	N/A	N/A
Top of Bank		

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:1
Right: 1:1

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP-754

Bank Stability Summary

Left Bank: Stable vegetation well established, no evidence of undercutting or erosion

Right Bank: ↑ Same as Left ↑

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-3' – upland herbacious vegetation
3'-150' – cultivated crop field

Left: 0-2' – upland herbacious vegetation
2'-25' – Asphalt Road

Associated Wetland Present: Yes [X] No [ ]
If Yes, ID: Wetland A587

Associated Artificial Drain(s) Present: Yes [X] No [ ]
If Yes, ID: AD-523

Photos

	Direction	Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	R.to L

Supplemental Notes & Comments:

Non-jurisdictional roadside ditch along Pope Hill Road

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DI-A509
Data Point ID: DP-760 Date: 6/9/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Vlott and Nicole Dunbar
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.475060 Long: -79.149393

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
	X	3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
	X	a) Presence of Relatively Permanent Flowing or Standing Water
	X	b) A Natural Stream That Has Been Altered
	X	c) Excavated in a Jurisdictional WOTUS
X		d) Connects Two or More Jurisdictional WOTUS
X		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): N/A
Wetted Perimeter Width (ft.): N/A
Flow/Gradient Direction: NW

Geomorphologic Characteristics

Primary Substrate Class: Silt/Clay

	Width (ft.)	
	at DP	Max
OHWM	N/A	N/A
Top of Bank	3'	3'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:1
Right: 1:1

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP-760

Bank Stability Summary

Left Bank: very stable, vegetation growing on bank, no evidence of undercutting or sloughing

Right Bank: ↑ same as above ↑

Habitat Characteristics

Aquatic Vegetation Present: Yes ☐ No ☒
If Yes, Describe:

Aquatic Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Terrestrial Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-5' Upland/FAC plants (not mowed)
5'-150' cultivated/mowed hay field

Left: 0-150' PFO wetland on ditch part flowing E to W and Upland forest on section of ditch flowing S to N

Associated Wetland Present: Yes ☒ No ☐
If Yes, ID: Wetland A638

Associated Artificial Drain(s) Present: Yes ☒ No ☐
If Yes, ID: Artificial Drain AD524

Photos

	Direction	Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	R to L

Supplemental Notes & Comments:

Drains wetland A638 to agricultural pond outside study area

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: DI - A510
Data Point ID: DP- 776 Date: 6/10/16
Project Name: Ball Hill Wind Project
Evaluator(s): Ben Virts and Nicole Dutchy
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.4900502 Long: -79.151437

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
	X	a) Presence of Relatively Permanent Flowing or Standing Water
	X	b) A Natural Stream That Has Been Altered
X		c) Excavated in a Jurisdictional WOTUS
X		d) Connects Two or More Jurisdictional WOTUS
X		e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): N/A
Wetted Perimeter Width (ft.): N/A
Flow/Gradient Direction: West

Geomorphologic Characteristics

Primary Substrate Class: Silt

	Width (ft.)	
	at DP	Max
OHWM	1'	2'
Top of Bank	2'	3'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:3
Right: 1:1

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: 775

Bank Stability Summary

Left Bank: Stable – well vegetated

Right Bank: Stable - well vegetated

Habitat Characteristics

Aquatic Vegetation Present: Yes ☐ No ☒
If Yes, Describe:

Aquatic Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Terrestrial Organisms Observed: Yes ☐ No ☒
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: 0-150' - PEM/PSS wetland

Left: 0-5' - roadside bank
5'-30' - Asphalt main road
30'-35' - Ditch 35'-150' - Uplow

Associated Wetland Present: Yes ☒ No ☐
If Yes, ID: A641

Associated Artificial Drain(s) Present: Yes ☒ No ☐
If Yes, ID: AD-526

Photos

	Direction	Description
Upstream	S	
Dowsnstream	N	
Cross Channel	W	RoL

Supplemental Notes & Comments:

FISHER ASSOCIATES

Ditch Data Form

Ditch Field ID: Ditch BS11
Data Point ID: DP-782 Date: 6/22/16
Project Name: Ball Hill Wind Project
Evaluator(s): B. Viets, J. Sauder
County: Chautauqua State: NY
Jurisdictional: Yes [X] No [ ]
Lat: 42.5083498 Long: -79.1573107

Jurisdictional Determination Criteria		
Yes	**No**	**Jurisdictional Attribute**
X		1) Defined Bed and Bank Present
X		2) Ordinary High Water Mark Present
X		3) Direct or Indirect Connection to a Traditional Navigable Water
		4) Supplementing Attributes (Must Satisfy At Least 1 of 5 Below)
	X	a) Presence of Relatively Permanent Flowing or Standing Water
	X	b) A Natural Stream That Has Been Altered
	X	c) Excavated in a Jurisdictional WOTUS
X		d) Connects Two or More Jurisdictional WOTUS
	X	e) Drains Natural Water Bodies (including wetlands) into the tributary system of a TNW

Hydrologic Characteristics

Surface Water: Present [ ] Absent [X]
Perceptible Flow: Present [ ] Absent [X]
Water Depth at Thalweg (ft.): NA
Wetted Perimeter Width (ft.): NA
Flow/Gradient Direction: West

Geomorphologic Characteristics

Primary Substrate Class: Silt/clay

	Width (ft.)	
	at DP	Max
OHWM	2'	3'
Top of Bank	9'	9'

Bank Slope [Reported as % or Horizontal:Vertical(H:V)]:
Left: 1:1
Right: 1:1

FISHER ASSOCIATES

Ditch Data Form

Data Point ID: DP-782

Bank Stability Summary

Left Bank: Banks are fully vegetated with no Erosion Present

Right Bank: Same as Left Bank

Habitat Characteristics

Aquatic Vegetation Present: Yes [ ] No [X]
If Yes, Describe:

Aquatic Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Terrestrial Organisms Observed: Yes [ ] No [X]
If Yes, Describe:

Riparian Characteristics

Riparian Vegetation Description (0' to 150' from TOB):

Right: Forest 0'-150'

Left: 0'-10' Facultative shrubs and herbaceous buffer
10'-150' Plowed Row crop Field

Associated Wetland Present: Yes [X] No [ ]
If Yes, ID: Offsite to East, no ID.

Associated Artificial Drain(s) Present: Yes [ ] No [X]
If Yes, ID:

Photos

	Direction	Description
Upstream	E	
Dowsnstream	W	
Cross Channel	S	RTL

Supplemental Notes & Comments:

APPENDIX D
REPRESENTATIVE SITE PHOTOGRAPHS

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 1

Facing West

Description:

Data Point 1
PEM Wetland Data
Point for Wetland A1

Photo No. 2

Facing East

Description:

Data Point 2
Upland Data Point for
Wetland A1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 3	
Facing North/Upstream	
Description: Data Point 6 Stream Data Point for Stream 1	

Photo No. 4	
Facing East/Right to Left	
Description: Data Point 7 Stream Data Point for Stream 2	

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 5

Facing South/Downstream

Description:

Data Point 10
Stream Data Point for Stream 3

Photo No. 6

Facing Upstream

Description:

Data Point 11
Stream Data Point for Stream 4

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 7

Facing North/Right to Left

Description:

Data Point 12
Stream Data Point for Stream 5

Photo No. 8

Facing East

Description:

Data Point 13
PEM wetland Data Point for Wetland C1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 9

Facing West

Description:

Data Point 14
Upland Data Point for Wetland C1

Photo No. 10

Facing North

Description:

Ditch C1
Ditch between two agricultural fields

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 11

Facing East

Description:

Data Point 16
Upland Data Point for Wetland D1

Photo No. 12

Facing West

Description:

Data Point 15
PEM Wetland Data Point for Wetland D1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 13

Facing North

Description:

Ditch D1
Ditch between two agricultural fields

Photo No. 14

Facing North

Description:

Data Point 24
PEM Wetland Data Point for Wetlands I1 and I2

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 15

Facing East

Description:

Data Point 30
PEM Wetland Data Point for Wetland J3

Photo No. 16

Facing West

Description:

Data Point 31
Upland Data Point for Wetland J3

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 17

Facing North

Description:

Data Point 46
PEM Wetland Data
Point for Wetland N1

Photo No. 18

Facing South

Description:

Data Point 47
Upland Data Point for
Wetland N1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 19

Facing North

Description:

Data Point 50
PSS Wetland Data
Point for Wetland P1

Photo No. 20

Facing South

Description:

Data Point 51
Upland Data Point for
Wetland P1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 21

Facing West

Description:

Data Point 55
PEM Wetland Data Point for Wetland R1

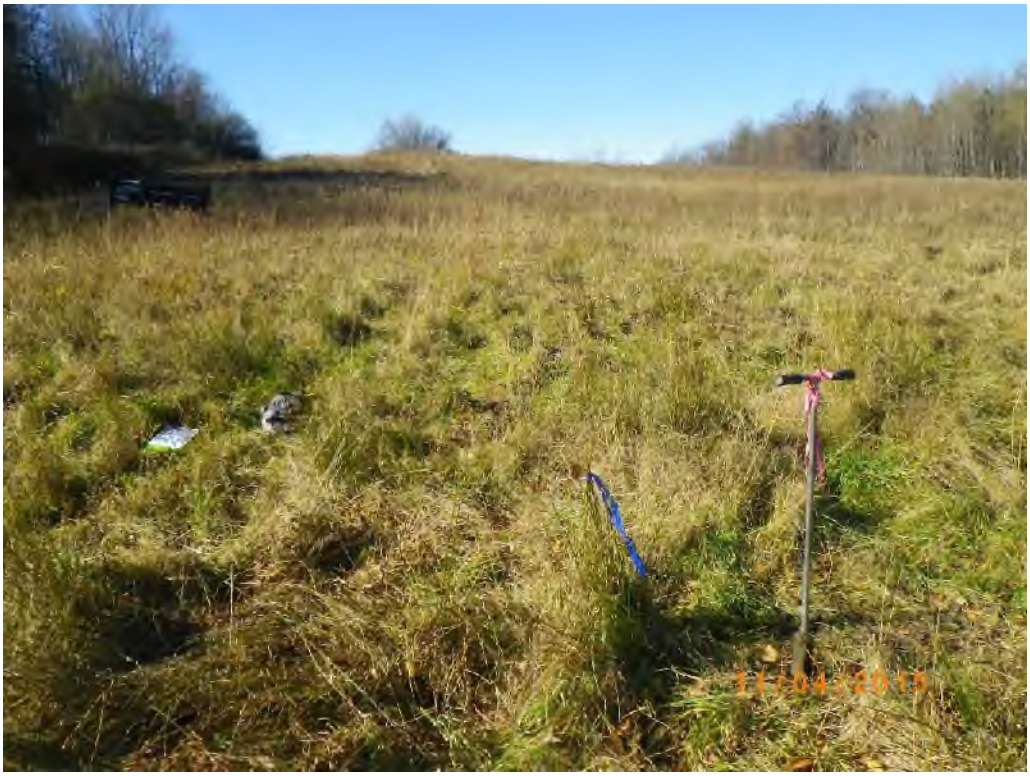

Photo No. 22

Facing East

Description:

Data Point 56
Upland Data Point for Wetland R1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 23

Facing North/Downstream

Description:

Data Point 63
Stream Data Point for Stream 11

Photo No. 24

Facing East

Description:

Data Point 64
Wetland Data Point for Wetland V1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 25

Facing West

Description:

Data Point 65
Upland Data Point for Wetland V1

Photo No. 26

Facing East/Right to Left

Description:

Data Point 69
Stream Data Point for Stream 13

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 27

Facing East/Downstream

Description:

Data Point 68
Stream Data Point for Stream 12

Photo No. 28

Facing East/Downstream

Description:

Data Point 73
Stream Data Point for Stream 15

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 29

Facing East/Downstream

Description:

Data Point 76
Stream Data Point for Stream 16

Photo No. 30

Facing South

Description:

Data Point 77
PFO Wetland Data Point for Wetland W1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 31

Facing North

Description:

Data Point 78
Upland Data Point for
Wetland W1

Photo No. 32

Facing Northwest

Description:

Data Point 81
PEM Wetland Data
Point for Wetland X1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 33

Facing Southeast

Description:

Data Point 82
Upland Data Point for
Wetland X1

Photo No. 34

Facing
East/Downstream

Description:

Data Point 83
Stream Data Point for
Stream 17

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 35

Facing East/Downstream

Description:

Data Point 90
Stream Data Point for Stream 18

Photo No. 36

Facing North

Description:

Data Point 91
PEM Wetland Data Point for Wetland A5

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 37

Facing South

Description:

Data Point 92
Upland Data Point for Wetland A5

Photo No. 38

Facing West/Upstream

Description:

Data Point 95
Stream Data Point for Stream 19

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 39

Facing Southeast

Description:

Data Point 97
PEM Wetland Data
Point for Wetland A7

Photo No. 40

Facing Northwest

Description:

Data Point 98
Upland Data Point for
Wetland A7

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 41

Facing Southeast

Description:

Data Point 99
PEM Wetland Data Point for Wetland A8

Photo No. 42

Facing South

Description:

Data Point 100
Upland Data Point for Wetland A8

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 43

Facing South

Description:

Data Point 500
PEM Wetland Data
Point for Wetland A500

Photo No. 44

Facing North

Description:

Data Point 501
Upland Data Point for
Wetland A500

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 45

Facing North/Right to Left

Description:

Data Point 502
Stream Data Point for Stream A500

Photo No. 46

Facing North

Description:

Data Point 503
PSS/PEM Wetland Data Point for Wetland A501

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 47

Facing North

Description:

Data Point 505
PEM Wetland Data
Point for Wetland A502

Photo No. 48

Facing West

Description:

Data Point 506
Upland Data Point for
Wetland A503

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 49

Facing East

Description:

Data Point 509
PEM Wetland Data
Point for Wetland A504

Photo No. 50

Facing West

Description:

Data Point 510
Upland Data Point for
Wetland A504

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 51

Facing West

Description:

Overview of Pond A500

Photo No. 52

Facing West

Description:

Data Point 511
PEM Wetland Data
Point for Wetland A505

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 53

Facing North

Description:

Data Point 513
PEM Wetland Data
Point for Wetland A507

Photo No. 54

Facing South

Description:

Data Point 516
PFO Wetland Data
Point for Wetland A509

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 55

Facing West

Description:

Data Point 517
Upland Data Point for
Wetland A509

Photo No. 56

Facing
West/Downstream

Description:

Data Point 520
Stream Data Point for
Stream A502

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 57

Facing North

Description:

Artificial Drain A500
6" steel drain tile outlet

Photo No. 58

Facing West

Description:

Ditch A500
Connection ditch for associated Artificial Drains/drain tiles

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 59

Facing East

Description:

Artificial Drain A503
10” clay drain tile connects to and shown within Ditch A500

Photo No. 60

Facing North

Description:

Artificial Drain A505
10” steel drain tile outlet

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 61

Facing North

Description:

Data Point 521
PEM Wetland Data
Point for Wetland A511

Photo No. 62

Facing West

Description:

Data Point 523
PEM Wetland Data
Point for Wetland A512

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 63

Facing East

Description:

Data Point 524
Upland Data Point for
Wetland A512

Photo No. 64

Facing
West/Upstream

Description:

Data Point 525
Stream Data Point for
Stream A504

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 65

Facing West/Upstream

Description:

Data Point 526
Stream Data Point for Stream A505

Photo No. 66

Facing South

Description:

Data Point 528
PEM wetland Data Point for Wetland A515

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 67

Facing South

Description:

Data Point 529
Upland Data Point for
Wetland A516

Photo No. 68

Facing South/Downstream

Description:

Data Point 530
Stream Data Point for
Stream A507

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 69

Facing South

Description:

Data Point 539
PFO wetland Data Point for Wetland A521

Photo No. 70

Facing North

Description:

Data Point 540
Upland Data Point for Wetland A521

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 71

Facing East/Downstream

Description:

Data Point 547
Stream Data Point for Stream A509

Photo No. 72

Facing North

Description:

Data Point 555
PEM Wetland Data Point for Wetland A532

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 73

Facing North

Description:

Data Point 556
Upland Data Point for Wetland A532 and A533

Photo No. 74

Facing South

Description:

Data Point 561
PFO Wetland Data Point for Wetland A535

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 75

Facing South

Description:

Data Point 562
Upland Data Point for
Wetland A535

Photo No. 76

Facing
North/Upstream

Description:

Data Point 563
Stream Data Point for
Stream A510

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 77

Facing North

Description:

Data Point 569
PEM Wetland Data
Point for Wetland A540

Photo No. 78

Facing South

Description:

Data Point 570
Upland Data Point for
Wetland A540

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 79

Facing North/Upstream

Description:

Data Point 573
Stream Data Point for Stream A511

Photo No. 80

Facing South/Downstream

Description:

Data Point 574
Stream Data Point for Stream A512

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 81

Facing North

Description:

Data Point 575
PEM Wetland Data
Point for Wetland A543

Photo No. 82

Facing South

Description:

Data Point 576
Upland Data Point for
Wetland A543

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 83

Facing South

Description:

Data Point 577
PEM Wetland Data
Point for Wetland A544

Photo No. 84

Facing North

Description:

Data Point 578
Upland Data Point for
Wetland A544

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 85

Facing West/Right to Left

Description:

Data Point 588
Stream Data Point for Stream A516

Photo No. 86

Facing West

Description:

Data Point 589
PFO Wetland Data Point for Wetland A553

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 87

Facing North

Description:

Data Point 590
Upland Data Point for
Wetland A553

Photo No. 88

Facing
West/Upstream

Description:

Data Point 591
Stream Data Point for
Stream A517

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 89

Facing East

Description:

Photo of Wetland A556

Photo No. 90

Facing North

Description:

Data Point 595
PEM Wetland Data
Point for Wetland A552

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 91

Facing North

Description:

Data Point 601
PEM Wetland Data
Point for Wetland A557

Photo No. 92

Facing North

Description:

Data Point 602
Upland Data Point for
Wetland A557

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 93

Facing South/Upstream

Description:

Data Point 603
Stream Data Point for Stream A518

Photo No. 94

Facing North

Description:

Data Point 604
PEM Wetland Data Point for Wetland A562

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 95

Facing West

Description:

Data Point 605
Upland Data Point for
Wetland A562

Photo No. 96

Facing
East/Downstream

Description:

Data Point 608
Stream Data Point for
Stream A519

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 97

Facing West/Upstream

Description:

Data Point 609
Stream Data Point for Stream A520

Photo No. 98

Facing South

Description:

Data Point 610
PEM Wetland Data Point for Wetland A565

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 99

Facing North

Description:

Data Point 611
Upland Data Point for Wetland A565

Photo No. 100

Facing West

Description:

Photo of Wetland A566
This wetland is a purpose-built treatment wetland for manure management servicing the adjacent livestock feedlot and associated structures.

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 101

Facing West

Description:

Photo of portion of Wetland A566 down gradient of the treatment wetland area shown in the photo above. This portion of the wetland is located within an active livestock feedlot and provides a downstream connection to a roadside ditch.

Photo No. 102

Facing West/Upstream

Description:

Data Point 612
Stream Data Point for Stream A521

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 103

Facing South/Upstream

Description:

Data Point 619
Stream Data Point for Stream A522

Photo No. 104

Facing North

Description:

Data Point 620
PEM Wetland Data Point for Wetland A573

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 105

Facing East

Description:

Data Point 621
Upland Data Point for
Wetland A573

Photo No. 106

Facing South

Description:

Data Point 622
PSS Wetland Data
Point for Wetland A578

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 107

Facing North

Description:

Data Point 623
Upland Data Point for Wetland A578

Photo No. 108

Facing West

Description:

Data Point 636
PFO/PSS Wetland Data Point for Wetland A585

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 109

Facing East

Description:

Data Point 637
Upland Data Point for
Wetland A585

Photo No. 110

Facing North

Description:

Data Point 638
PFO Wetland Data
Point for Wetland A586

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 111

Facing South

Description:

Data Point 639
Upland Data Point for
Wetland A586

Photo No. 112

Facing
North/Upstream

Description:

Data Point 642
Stream Data Point for
Stream A524

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 113

Facing North

Description:

Data Point 645
PSS/PEM Wetland Data Point for Wetland A589

Photo No. 114

Facing West

Description:

Data Point 646
Upland Data Point for Wetland A589

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 115

Facing South

Description:

Data Point 652
PFO Wetland Data Point for Wetland A593

Photo No. 116

Facing North

Description:

Data Point 653
Upland Data Point for Wetlands A593 and A594

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 117

Facing West

Description:

Data Point 654
PFO Wetland Data Point for Wetland A594

Photo No. 118

Facing West/Downstream

Description:

Data Point 655
Stream Data Point for Stream A525

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 119

Facing North/Downstream

Description:

Data Point 656
Stream Data Point for Stream A526

Photo No. 120

Facing East/Downstream

Description:

Data Point 657
Stream Data Point for Stream A527

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 121

Facing East/Upstream

Description:

Data Point 658
Stream Data Point for Stream A528

Photo No. 122

Facing South

Description:

Overview of Expansion of PEM Wetland A519 from Photo Point 1

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 123

Facing East

Description:

Overview of Wetland A597 from PSS Data Point 663

Photo No. 124

Facing South

Description:

Overview of Uplands Adjacent to Wetland A597 from Data Point 664

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 125

Facing Downstream/ North

Description:

Data Point 666
Data Point for
Stream A529

Photo No. 126

Facing Upstream/South

Description:

Data Point 667
Data Point for
Stream A530

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 127

Facing Downstream/North

Description:

Data Point 667
Data Point for
Stream A530

Photo No. 128

Facing East

Description:

Overview of Wetland A600 from PEM Data Point 672

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 129

Facing East

Description:

Overview of Wetland A602 from PEM Data Point 675

Photo No. 130

Facing East

Description:

Data Point 676
Upland Data Point
Adjacent to Wetland A602

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 131

Facing Upstream/ West

Description:

Data Point 686
Data Point for
Stream A532

Photo No. 132

Facing Downstream/ East

Description:

Data Point 843
Data Point for
Stream A532

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 133

Facing South

Description:

Overview of Wetland A609 from PFO Data Point 689

Photo No. 134

Facing South

Description:

Overview of Uplands Adjacent to Wetland A609 from Data Point 690

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 135

Facing East

Description:

Overview of Wetland A615 from PEM Data Point 699

Photo No. 136

Facing East

Description:

Overview of Uplands Adjacent to Wetland A615 from Data Point 700

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 137

Facing West

Description:

Overview of Wetland A616 from PEM Data Point 701

Photo No. 138

Facing South

Description:

Overview of Uplands Adjacent to Wetland A616 from Data Point 702

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 139

Facing South

Description:

Overview of Wetland A618 from PFO Data Point 704

Photo No. 140

Facing South

Description:

Overview of Wetland A618 from PEM Data Point 705

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 141

Facing East

Description:

Overview of Uplands Adjacent to Wetland A618 from Data Point 706

Photo No. 142

Facing Upstream/ West

Description:

Data Point 707 Data Point for Stream A533

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 143

Facing Right to Left Bank/ North

Description:

Data Point 707
Data Point for Stream A533

Photo No. 144

Facing West

Description:

Overview of Wetland A620 from PEM Data Point 710

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 145

Facing West

Description:

Overview of Uplands Adjacent to Wetland A620 from Data Point 711

Photo No. 146

Facing Upstream/ West

Description:

Data Point 712 Data Point for Stream A534

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 147

Facing North

Description:

Overview of Wetland A627 from PFO Data Point 728

Photo No. 148

Facing West

Description:

Overview of Uplands Adjacent to Wetland A627 from Data Point 729

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 149

Facing West

Description:

Overview of Wetland A632 from PEM Data Point 735

Photo No. 150

Facing South

Description:

Overview of Uplands Adjacent to wetland A632 from Data Point 737

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 151

Facing West

Description:

Overview of Wetland A634 from PFO Data Point 740

Photo No. 152

Facing West

Description:

Overview of Uplands Adjacent to Wetland A634 from Data Point 741

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 153

Facing Downstream/ North

Description:

Data Point 747
Data Point for Stream A537

Photo No. 154

Facing East

Description:

Overview of Wetland A635 from PEM Data Point 748

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 155

Facing South

Description:

Overview of Uplands Adjacent to Wetland A635 from Data Point 749

Photo No. 156

Facing Downstream/ West

Description:

Data Point 762 Data Point for Stream A540

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 157

Facing North

Description:

Data Point 763
PFO Data Point
Wetland A639

Photo No. 158

Facing North

Description:

Overview of Uplands Adjacent to Wetland A639 from Data Point 769

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 159

Facing North

Description:

Overview of Wetland A641 from PEM Data Point 773

Photo No. 160

Facing North

Description:

Data Point 774
PSS Data Point
Wetland A641

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 161

Facing West

Description:

Overview of Uplands Adjacent to Wetland A641 from Data Point 775

Photo No. 162

Facing North

Description:

Overview of PEM Portion of Wetland A200 from PEM Data Point 200

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 163

Facing Southeast

Description:

Overview of PFO Portion of Wetland A200 from PFO Data Point 202

Photo No. 164

Facing Southwest

Description:

Overview of Wetland A202 from PEM Data Point 206

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 165

Facing Southeast

Description:

Overview of Uplands Adjacent to Wetlands A202 and A203 from Data Point 207

Photo No. 166

Facing Northwest

Description:

Overview of Wetland A203 from PEM Data Point 208

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 167

Facing Upstream/ Northeast

Description:

Data Point 211
Data Point for Stream A200

Photo No. 168

Facing Southwest

Description:

Overview of Wetland A206 from PEM Data Point 216

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 169

Facing South

Description:

Overview of Wetland A207 from PSS Data Point 217

Photo No. 170

Facing North

Description:

Overview of Wetland A208 from PSS Data Point 221

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 171

Facing Upstream/ East

Description:

Data Point 222
Data Point for Stream A202

Photo No. 172

Facing East

Description:

Overview of Uplands Adjacent to Wetland A209 from Data Point 225

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 173

Facing West

Description:

Overview of Wetland A10 from PEM Data Point 227

Photo No. 174

Facing East

Description:

Overview of Wetland A212 from PEM Data Point 229

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 175

Facing West

Description:

Overview of Wetland A213 from PSS Data Point 230

Photo No. 176

Facing North

Description:

Overview of Uplands Adjacent to Wetland A213 from Data Point 231

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 177

Facing Downstream/ North

Description:

Data Point 243
Data Point for Stream A203

Photo No. 178

Facing West

Description:

Overview of Wetland A220 from PEM Data Point 244

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 179

Facing East

Description:

Overview of Uplands Adjacent to Wetland A220 from Data Point 245

Photo No. 180

Facing South

Description:

Overview of Wetland A221 from PEM Data Point 247

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 181

Facing Downstream/ Southeast

Description:

Data Point 249
Data Point for
Stream A204

Photo No. 182

Facing East

Description:

Overview of Wetland A232 from PEM Data Point 269

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 183

Facing East

Description:

Overview of Uplands Adjacent to Wetlands A232 and A233 from Data Point 271

Photo No. 184

Facing Downstream/ East

Description:

Data Point 272 Data Point for Stream A205

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 185

Facing South

Description:

Overview of Wetland A236 from PSS Data Point 277

Photo No. 186

Facing Upstream/ South

Description:

Data Point 278
Data Point for Stream A207

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 187

Facing Upstream/ East

Description:

Data Point 287
Data Point for
Stream A210

Photo No. 188

Facing Downstream/ North

Description:

Data Point 288
Data Point for
Stream A211

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 189

Facing East

Description:

Overview of Wetland A238 from PSS Data Point 292

Photo No. 190

Facing Upstream/ East

Description:

Data Point 293 Data Point for Stream A212

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 191

Facing East

Description:

Overview of Wetland A239 from PEM Data Point 295

Photo No. 192

Facing West

Description:

Overview of Uplands Adjacent to Wetlands A238 and A239 from Data Point 297

FISHER ASSOCIATES

PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 193

Facing East

Description:

Overview of Wetland A643 from PEM Data Point 777

Photo No. 194

Facing West

Description:

Overview of Uplands Adjacent to Wetland A643 from Data Point 778

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PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 195

Facing West

Description:

Overview of PEM portion of Wetland A643 and associated Pond A643

Photo No. 196

Facing East

Description:

Overview of Pond A643

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PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 197

Facing West

Description:

Overview of PEM portion of Wetland A643

Photo No. 198

Facing West

Description:

Overview of PEM portion of Wetland A643

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PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 199

Facing West

Description:

Overview of PEM portion of Wetland A643 located within active hay field

Photo No. 200

Facing North

Description:

Overview of PEM portion of Wetland A643 located within active hay field

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PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 201

Facing West

Description:

Overview of PFO within Wetland A593

Photo No. 202

Facing West

Description:

Overview of PFO within Wetland A593

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PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 203

Facing South

Description:

Overview of PFO from within Wetland A594

Photo No. 204

Facing East

Description:

Overview of PFO from within Wetland A594

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PHOTOGRAPHIC RECORD

Project Name:	Site Location:	Project No.
Ball Hill Wind Project	Chautauqua County, NY	150001

Photo No. 205

Facing South

Description:

Overview of PEM from within Wetland A594

Photo No. 206

Facing East

Description:

Overview of PEM from within Wetland A594

F

Conceptual Wetland Mitigation Plan

PREPARED FOR:

BALL HILL WIND ENERGY, LLC
11101 WEST 120TH AVENUE, SUITE 400
BROOMFIELD, CO 80021

BALL HILL WIND PROJECT

CONCEPTUAL MITIGATION PLAN

OCTOBER 2016

PREPARED BY:

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325 DELAWARE AVENUE, SUITE 200
BUFFALO, NEW YORK 14202
FISHER ASSOCIATES PROJECT NO. 150001

EXECUTIVE SUMMARY

This Conceptual Mitigation Plan ("Plan") is proposed to address permanent impacts to wetlands resulting from construction and operation of the Ball Hill Wind Project ("Project") in the Towns of Villenova and Hanover, Chautauqua County, New York. This Plan has been prepared to support Ball Hill Wind Energy LLC's ("Ball Hill") Joint Application for Permit to the United States Army Corps of Engineers ("USACE") and the New York State Department of Environmental Conservation ("NYSDEC").

Ball Hill has developed this Plan to include consideration of two wetland mitigation approaches to offset Project impacts: the availability of suitable onsite wetland mitigation opportunities and regional offsite in-lieu fee wetland mitigation opportunities.

Impacts from construction of the Project will result in the permanent fill of a total of 0.87 acre of wetlands under the jurisdiction of the USACE. While the Project will not result in the permanent loss of any NYSDEC Freshwater Wetlands (FWW), approximately 2.82 acres of forested FWW will be permanently converted to shrub-scrub or emergent wetland as a result of the construction of the transmission line.

Consistent with the USACE guidance, mitigation for Project-related impacts to wetlands under its sole jurisdiction will be accomplished through use of an in-lieu fee program. The NYSDEC requires unavoidable impacts to state FWWs to be mitigated "in-kind" and "onsite." Generally, this requires mitigation to occur contiguous with the FWW that is impacted. Off-site mitigation (mitigation that occurs within a larger project boundary, on adjacent properties, elsewhere in the watershed, or within a larger political, ecological or geographic area), is acceptable in some circumstances, particularly where onsite mitigation is not possible or desirable. For the purposes of this Plan, mitigation for the conversion of forested FWW is being proposed onsite, in areas adjacent to the impacts.

Conceptual planning aspects including wetland functions and values; onsite mitigation opportunities and goals; implementation planning; performance standards and monitoring; and schedule have been considered and are provided in this Plan for review. Ball Hill will develop a final mitigation plan, with consideration given to this Plan, in consultation with the USACE and NYSDEC as part of their respective permit programs.

CONCEPTUAL MITIGATION PLAN
BALL HILL WIND PROJECT

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PROJECT INFORMATION SHEET

General

Project Name:	Ball Hill Wind Project
State:	New York
County:	Chautauqua
Towns:	Villenova and Hanover
Latitude:	42.440000 North
Longitude:	-79.128000 West
Project Study Area Size:	665 acres
HUC Code:	04120101 (Chautauqua-Conneaut Watershed) and 05010002 (Conewango Watershed)
Waterbodies (TNW):	Tupper Creek; unnamed contributing tributaries to the North Branch of Conewango Creek, Silver Creek, Tupper Creek, Walnut Creek, and the West Branch of Conewango Creek; and associated palustrine emergent, scrub-shrub, and forested wetlands

Corresponding Information

USGS Quad Map:	Silver Creek, Forestville, and Perrysburg
USDA Soils Map:	Chautauqua County

Owner/Applicant

Name:	Ball Hill Wind Energy, LLC
Address:	11101 West 120th Avenue, Suite 400 Broomfield, CO 80021
Contact:	Sean Flannery

Consultant

Name:	Fisher Associates
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Contact:	Pat McCarthy: (716) 858-1234 ext. 307 Ben Virts: (585) 334-1310 ext. 286

1.0 INTRODUCTION

This Conceptual Mitigation Plan ("Plan") is proposed to address permanent impacts to wetlands resulting from construction and operation of the Ball Hill Wind Project ("Project") in the Towns of Villenova and Hanover, Chautauqua County, New York. This Plan has been prepared to support Ball Hill Wind Energy LLC's ("Ball Hill") Joint Application for Permit to the United States Army Corps of Engineers ("USACE") and the New York State Department of Environmental Conservation ("NYSDEC"). Fisher Associates ("Fisher") delineated and evaluated wetlands and waterbodies regulated by the USACE under Sections 401 and 404 of the Clean Water Act ("CWA") and by NYSDEC under the Article 24, Freshwater Wetlands Act, and Article 15, Protection of Waters Program. Jurisdictional wetland determinations were confirmed by the USACE and NYSDEC during separate site visits on August 24, 2016 and September 14, 2016, respectively. Specific details of the wetland delineation are provided in the Wetland Delineation Report prepared for the Project.

This Plan provides background information on existing conditions in the Project area and the concepts that will be applied to the design of a final mitigation plan. Ball Hill has developed this Plan to include consideration of two wetland mitigation approaches to offset Project impacts: the availability of suitable onsite wetland mitigation opportunities and regional offsite in-lieu fee wetland mitigation opportunities. Ball Hill will develop a final mitigation plan in consultation with the USACE and NYSDEC prior to the Project implementation.

1.1 Project Description

Ball Hill Wind Energy, LLC (Ball Hill), a company owned by Renewable Energy Systems Americas, Inc. (RES), proposes to construct and operate the 100 MW Ball Hill Wind Project (Project) in the towns of Villenova and Hanover, Chautauqua County, New York. The Project consist of 29, 3.45 MW wind turbines, approximately 13 miles of access roads, approximately 15 miles of collection lines, and 5.7 miles of 115-kV electrical transmission line. Construction of the Project is anticipated to begin in 2017.

1.2 Project Impacts

Section 404 of the Clean Water Act authorizes the USACE to issue permits regulating the discharge of dredged or fill materials into the waters of the United States, including wetlands. There is no minimum size for wetlands to be regulated under federal jurisdiction; however, wetlands that do not have a hydrological connection to waters of the United States (isolated wetlands) may not be subject to federal jurisdiction. Under Article 24 of the NYS ECL, NYSDEC regulates Freshwater wetlands (FWW) that exceed 12.4 acres (5 hectares) in size or have unusual local importance. NYS also regulates a 100-foot upland adjacent area surrounding each regulated wetland. The NYSDEC and USACE maintain dual jurisdiction over these areas. The following is a description of the Project related impacts, by jurisdiction.

Wetlands under Federal Jurisdiction

Ball Hill has elected to seek a Preliminary Jurisdictional Determination (PJD) from the USACE for the Project. In seeking a PJD, the applicant requests that the USACE assume jurisdiction over all wetlands regardless of surface water connections to traditionally navigable waterways. As indicated above, the permanent grading activities necessary to construct and operate the Project will result in the permanent loss of 0.87 acres of wetland (see Table 1). This includes 0.44 acre of palustrine emergent (PEM), 0.24 acres of palustrine scrub-shrub (PSS), and 0.19 acre of palustrine forested (PFO) wetland. In addition to the 0.87 acres of permanent fill, approximately 6.54 acres of forested wetland areas will be converted to areas that will be permanently maintained as scrub-shrub or emergent wetlands.

In addition to the permanent wetland loss, approximately 25 acres of wetland may be temporarily impacted during the construction of the Project. These temporary impacts include grading, dredging for installation of underground electric lines, and removal of wetland vegetation. As these impacted areas will be restored after the completion of construction, no additional compensatory mitigation is being proposed.

Wetlands under State Jurisdiction

Construction of the Project will not result in the permanent loss of NYSDEC FWW. However, construction of the transmission line will result in the permanent conversion of 2.82-acres of forested wetland (see Table 1). The areas within the 80-foot wide right-of-way will be maintained in an emergent or scrub-shrub state. In addition to the conversion of forested wetland areas, an additional 1.55 acres of forested 100-foot upland adjacent area will be clear cut and maintained in a scrub-shrub or meadow state.

Table 1. Project Wetland Impacts

Watershed	USACE Permanent Fill	USACE Permanent Forest Conversion	NYSDEC Permanent Fill	NYSDEC Permanent Forest Conversion[1]	NYSDEC 100-ft Adjacent Area Conversion
Conewango	0.47	0.08	0	0	0
Chautauqua-Conneaut	0.40	6.46	0	2.82	1.55
Total	**0.87**	**6.54**	**0**	**2.82**	**1.55**

1. NYSDEC Permanent Forest Conversion is a subset of the USACE Permanent Forest Conversion, as these agencies maintain dual jurisdiction of the impacted wetlands.

1.3 Avoidance and Minimization

Ball Hill undertook an intensive, multi-phased siting process to avoid and minimize potential impacts on wetlands. The Project design effort considered siting factors that include topography, location of wetlands and other sensitive resources, availability of sufficient wind resources, proximity to existing roads and transmission lines, locations of residential dwellings, potential impacts from noise, and landowner access agreements. Each factor imposed limitations on the amount of flexibility available during the facility siting process. Once these factors were considered, turbines and ancillary facilities (i.e., roads and collection system) were sited to avoid and/or minimize environmental impacts. Ball Hill made every effort to use previously disturbed areas, such as farmlands and roads, and avoid wetland and stream crossings. Despite an extensive effort to entirely avoid wetland impacts it was not possible to design the Project without some impacts on wetlands while still meeting Project objectives

Multiple wetland studies and delineations were previously completed to determine the extent and quality of wetlands that could potentially be impacted by the Project. Previous wetland studies included a desktop review of existing wetland location information and mapping, reconnaissance-level wetland surveys, and detailed wetland delineations in 2008. Since that time, additional rounds of wetland delineations were conducted in 2011/2012. These previous studies confirm that wetlands under state and federal jurisdiction exist within the Project Site and provide information on the extent and quality of those wetlands. Updated wetland delineations began in 2015 and were completed in 2016. Each phase of the wetland delineations was used to determine changes in the wetlands in the Project Site and refine siting for the Project components to avoid and/or minimize impacts on wetlands while balancing impacts on other resources. The delineated wetland boundaries for the Project were added to facility mapping and used to further refine the location of turbine sites, roads, electrical collection lines, the transmission line and substation, and other ancillary facilities to avoid and minimize impacts on wetlands to the extent practicable.

In addition to the intensive desktop and field review of potential layouts, the Project has undergone a change in the proposed wind turbine generators. The initial Project was designed utilizing 60 1.5MW machines to achieve the Project output of 90MW. Ball Hill is now proposing to use 29 3.45MW machines to achieve a Project output of 100.05 MW.

2.0 MITIGATION GOALS AND OBJECTIVES

Within the federal and state regulatory framework, compensatory mitigation can only be considered after the project proponent demonstrates avoidance and minimization to the extent possible. Following the review and acceptance by agencies regarding the alternatives analysis conducted to demonstrate minimization of impacts, compensatory mitigation must be developed to offset project-related impacts. With respect to the Project, unavoidable permanent wetland impacts will result from a network of interconnecting roads and associated electric connection and transmission lines required to access the Project facilities and connect the Project to the local electric grid.

Based on USACE guidance, mitigation can be completed either financially, in the form of an in-lieu fee, land acquisition for preservation purposes, regional mitigation banking, or in the form of a specific wetland restoration, creation, or enhancement project developed in conjunction with the proposed Project. Depending on agency input and local availability of existing mitigation opportunities, the mitigation may also take the form of a consolidated mitigation plan, combining two or more of the available mitigation options.

The NYSDEC requires unavoidable impacts to state FWWs to be mitigated "in-kind" and "onsite." Generally, this requires mitigation to occur contiguous with the FWW that is impacted. Off-site mitigation (mitigation that occurs within a larger project boundary, on adjacent properties, elsewhere in the watershed, or within a larger political, ecological or geographic area) is acceptable in some circumstances, particularly where onsite mitigation is not possible or desirable. At this time, NYSDEC does not allow mitigation through the in-lieu fee or mitigation banking programs.

2.1 Mitigation for Wetlands under Federal Jurisdiction

As noted, the Project will result in the loss of 0.87 acres of wetland under federal jurisdiction resulting from the construction of permanent access roads and ancillary facilities. While potential mitigation options likely exist onsite, Ball Hill is proposing to utilize and in-lieu-fee mitigation arrangement to compensate for the lost wetland areas. While onsite mitigation would provide net benefits in the immediate vicinity of the impacted areas, the small acreage of creation likely to be required (approximately 2-acres) would be of limited value to the overall landscape. By proposing to use the in-lieu-fee program, the mitigation for the relatively small impacts resulting from the construction of the Project would be combined with mitigation efforts for impacts elsewhere to create a much larger mitigation site that would ultimately provide significant value within the region.

While the impacts to waters under the jurisdiction of the USACE occur within the both the Conewango and the Chautauqua-Conneaut watershed, Ball Hill is proposing to purchase credits from the in-lieu-fee mitigation program being offered in the Conewango watershed. Currently, there are no in-lieu fee mitigation opportunities within the Chautauqua-Conneaut watershed. Given the relative close proximity of the impacted wetlands to the watershed boundary, within 2-miles of the watershed line, the increased value of the in-lieu-fee mitigation should provide a net benefit.

2.2 Mitigation for Wetlands under NYSDEC Jurisdiction

Pursuant to NYSDEC requirements, Ball Hill is proposing onsite mitigation for the impacts resulting from the conversion of forested areas within FWW SC-12 and SC-13, as well as their associated upland adjacent areas. It is assumed that NYSDEC will require a mitigation ratio of 1:1 for the conversion impacts to both the wetland and upland adjacent areas.

2.2.1 Wetland Functions and Values

The NYSDEC Freshwater Wetlands Act outlines wetland functions and values as benefits which it seeks to preserve, protect and conserve because of the positive outcomes that they provide. These functions and values include:

- Flood and stormwater control;
- Wildlife habitat;

- Water supply;
- Water quality;
- Fisheries;
- Food chains;
- Recreation;
- Open space and aesthetic appreciation; and
- Education and scientific research

The permanent impacts to NYSDEC FWW and adjacent 100-foot adjacent areas will be limited to conversion of forested wetlands and associated forested adjacent areas to emergent or shrub-scrub wetlands. These jurisdictional wetland areas will continue to exist and provide significant function and value contributions. Most functions and values will continue with no or only minor reductions. The current flood and stormwater control, water supply, and fisheries functions are not anticipated to be significantly affected by tree canopy removal and replacement with an emergent or scrub-shrub community. Minor reductions of current functions corresponding to water quality, food chains, recreation, open space and aesthetic appreciation, and education and scientific research may result from the conversion of forested cover types to shrub or emergent communities as the vegetation community composition has some direct or indirect link to these functions. The primary function and value affected by the forested wetland conversion will be an anticipated wildlife habitat shift due to the removal of the overstory tree canopy. This conversion from forest to shrub/emergent cover types will bolster forest edge habitat and preferred habitat for grass and shrub land species, but will result in a long-term shift in wildlife habitat functions from their current forested state.

The final mitigation plan to be developed during the course of the Joint Application for Permit process will address the site-specific cumulative loss of biological function provided by the impacted wetlands, as well as any identified public value. Consistent with the NYSDEC guidance, the goal of the mitigation plan will be to create, enhance, and preserve existing wetland functions, values, and ecological integrity at a specific mitigation area to adequately offset the loss of function and value within jurisdictional wetlands resulting from Project implementation.

2.2.2 Mitigation Area Description

Based on the field surveys and review of mapped NYSDEC FWWs in proximity to the Project, multiple potential mitigation sites were considered. Because of the relatively small total acreage of impact, Ball Hill will plan to consolidate onsite mitigation into a single location to maximize functions and values of the mitigation area. By centralizing the onsite mitigation area into a single location, Ball Hill believes that the overall value of the mitigation area increases in relation to the surrounding landscape. During the course of the permit review process, Ball Hill will continue coordinating with local landowners regarding the acquisition of suitable parcels to implement mitigation, secured by a conservation easement to protect it in perpetuity.

Ball Hill is evaluating the suitability of the area depicted in Figure 2: Proposed Onsite Mitigation Area as the preferred onsite mitigation option ("Preferred Option"). The Preferred Option is hydrologically connected to waters of the United States and contiguous with the delineated boundaries of FWW SC-12 and SC-13. These areas are currently maintained as active and fallow agricultural fields. Based on field surveys, it appears that the hydrology in the area has been manipulated by past agricultural practices including ditching and possible drain tile installation. Despite these practices, hydrophytic plant species were noted within the potential mitigation areas. As such, it is assumed that this area could be restored within minimal site work.

The exact mitigation area size will be finalized through discussions with the USACE and NYSDEC as Project permitting proceeds. The location and details of the final mitigation area are dependent on site conditions and the ability to secure easements or purchase arrangements with the current landowners.

2.3.3 Onsite Mitigation Goals

Goals and objectives of the proposed mitigation project are derived from the lost or impaired functions and values of the onsite wetlands due to Project activities. Mitigation will offset the adverse effects on the benefits of a wetland and compensate for the lost wetland acreage. Ball Hill is proposing to perform onsite mitigation within active and fallow agricultural fields located to the south and east of FWW SC-12 and SC-13, respectively (see Figure 2). The goals of the onsite mitigation approach are to restore, augment, and preserve self-sustaining, functional wetland and upland adjacent area functions and values which have been degraded as a result of historical land use practices including logging and agriculture. The restoration/enhancement will focus on dynamic improvement of the overall holistic functions of the wetland and upland adjacent areas. The specific functional improvement goals include, but are not limited to:

1. Re-establish forested wetland presence and establish a high level of wetland functional diversity;
2. Improve onsite water quality and food chain diversity;
3. Improve nutrient and organic matter cycling;
4. Improve wetland and upland adjacent area terrestrial habitat;
5. Re-establish a diverse forested wetland/upland corridor composed of native species; and
6. Provide protection of the Preferred Option through appropriate legal protections to ensure the continuity of the functional improvement goals once established into perpetuity.

When creating the onsite mitigation concept for this Project, multiple approaches and alternatives were considered. The intensity of active functional improvement used in different areas is directly dependent on the degree of the current resource degradation in those areas. As such, the onsite mitigation approach incorporates a combination of conservation and active enhancement activities which maximize the ecological uplift achieved from implementation of the mitigation project, while minimizing the impacts from construction.

The proposed onsite mitigation project is intended to compensate for lost function and values of wetlands subject to permanent conversion impacts while providing a greater landscape scale benefit by enhancing one contiguous wetland complex. The primary function of the forested component to be permanently converted is wildlife habitat. The conversion of forested wetland due to ROW clearing and maintenance along the transmission line will result in a long-term shift in wildlife habitat functions. The goals and objectives for this proposed mitigation project are to enhance an existing wetland by planting trees, and to preserve in perpetuity the mitigation area via the establishment of a conservation easement. By meeting these goals, wildlife value of the mitigation area will be increased.

3.0 IMPLEMENTATION PLAN

There are several factors in the design and implementation of mitigation plan necessary to ensure success. Proactive planning and purposeful design are fundamental components. The Implementation Plan, to be included in the Final Mitigation Plan, will include specifications for planting, the sequence of operations, final quantification of materials, development of appropriate best management practices ("BMPs") and additional monitoring and maintenance plans. The wetland mitigation area will be designed to provide function and value equal to, or greater than, that of the forested wetlands that are permanently converted to shrub-scrub or emergent wetlands.

The goal of the Implementation Plan is to identify potential required design factors, as well as any necessary constraints that would interfere with the successful tree planting at the mitigation area. The objectives to attain this goal include: examining current vegetation communities in the mitigation area; examining current hydrologic and soil conditions in the mitigation area; determining the most appropriate species to be planted; determining the most efficient and effective means to accomplish tree planting; and ensuring the development of a diverse native plant community that minimizes interferences by invasive species.

The conceptual design components that will be implemented to offset permanent fill impacts and permanent conversion impacts include:

- Restoration and/or establishment of a wetland area with similar function and value to those lost due to permanent impact achieved through an in-lieu fee fund contribution;

- Tree planting within and in the vicinity of an existing wetland to compensate for function(s) lost by the conversion of forested wetland to non-forested wetland for wetlands that are both NYSDEC and federally jurisdictional; and

- Preservation of existing wetlands within the mitigation area via the establishment of conservation easement(s).

3.1 Restoration Methods

Preliminarily, the restoration methods will include wetland and upland adjacent area restoration throughout the proposed mitigation site. Currently, the majority of the wetland and upland adjacent areas present consist of an actively harvested agricultural fields lacking both tree and shrub layers. Restoration of these degraded areas will consist of converting the existing managed agricultural land to a diverse forested community. Heavy woody stem plantings are proposed to improve the wetland and adjacent area functions by filtering runoff, absorbing nutrients, lowering ambient habitat temperatures through shading, increasing woody and leafy debris organic materials, and providing diversified habitat for both aquatic and terrestrial wildlife species.

Pending the results of a detailed wetland delineation within the final site, wetland presence may also be increased, if needed, through grading alterations to encounter shallow groundwater hydrology and remove man-made ditches that serve to limit the persistence of ground and surface waters. Wetland augmentation areas will be assessed and projected based on planned grading characteristics, site soils properties, and potential hydrologic modifications which could be adjusted or eliminated to facilitate water table elevation rise. These wetlands will be planted with native wetland forest species to establish stability and foster a high level of wetland functional diversity.

Ball Hill does not plan to acquire the land required to implement this mitigation project. Easement agreement(s) will be sought with landowners for proposed onsite mitigation areas. Ball Hill will pursue discussions with landowners within and adjacent to the impacted wetlands regarding development of onsite mitigation and an accompanying conservation easement to protect such area.

3.2 Site Preparation

Once an onsite mitigation area selection has been finalized, additional field reconnaissance will be conducted to further characterize the area and determine preparation needs. Field investigations will include wetland delineations in the mitigation area in order to determine wetland/upland boundaries and to characterize vegetation communities. Additional due diligence investigation efforts will be implemented as appropriate and could include detailed topographic survey, groundwater monitoring, soils assessments, and/or hydrologic modeling.

3.3 Vegetative Establishment

The Implementation Plan will promote the introduction of native trees in the mitigation area that will enhance the natural plant communities and improve wildlife habitat. The species will be selected for enhancement of the mitigation area based on the hydrologic and soil conditions at the mitigation site, the species composition of the impacted wetlands, and species typical of undisturbed natural communities in the area.

Based on the vegetative communities observed within the impacted wetlands, the following species may be chosen for the mitigation area depending on availability and suitability for the chosen site:

- Red Maple (*Acer rubrum*)
- Yellow Birch (*Betula allegheninsis*)

- Silver Maple (*Acer saccharinum*)
- American Elm (*Ulmus americana*)
- Ironwood (*Carpinus caroliniana*)
- Eastern Hemlock (*Tsuga canadensis*)

Species that may be utilized in the upland adjacent area plantings include:

- Sugar Maple (*Acer saccharum*)
- Black Cherry (*Prunus serotina*)
- Basswood (*Tilia americana*)
- Quaking Aspen (*Populus tremuloides*)
- American Beech (*Fagus grandifolia*)
- Tulip Poplar (*Liriodendron tupilifera*)
- Eastern Hemlock (*Tsuga canadensis*)
- Red Pine (*Pinus resinosa*)

In addition to the tree species, several species of shrubs may also be planted in both wetland and upland area to augment and supplement the area while the slower growing tree species are establishing. Species that may be utilized include:

- Northern Spicebush (*Lindera benzoin*)
- Red Osier Dogwood (*Cornus alba*)
- Silky Dogwood (*Cornus amomum*)
- Gray Dogwood (*Cornus recemosa*)

A detailed wetland and buffer area planting plan will be developed to provide specifications as to the numbers of each species planted or their planting density, their location, source of planting material, and establishment methods. The planting plan is anticipated to establish a menu of appropriate species plantings and specify a planting density appropriate to ensure success. The planting plan will be a component of the final mitigation design package and will be made available to the USACE and NYSDEC for review.

3.4 Wetland Restoration

In the event that it is necessary to increase wetland presence onsite through restorative grading alterations, a detailed engineering plan will be provided which will outline proposed wetland restoration methods. The engineering plan would provide detail of existing and proposed site conditions including topography, soils, and hydrology characteristics. Restored wetlands would be planted with native wetland forest species to establish stability and foster a high level of wetland functional diversity. If proposed, the engineering plan will be a component of the final mitigation design package and will be made available to the USACE and NYSDEC for review.

4.0 PERFORMANCE STANDARDS AND MONITORING

Performance standards will be developed to assess the condition and functionality of the mitigation area. The standards will assess the development and survival of the enhanced vegetation communities. Relative success or failure of the vegetation community will be based on a percent survival that will be developed in conjunction with the regulatory agencies and presented in the Final Mitigation Plan.

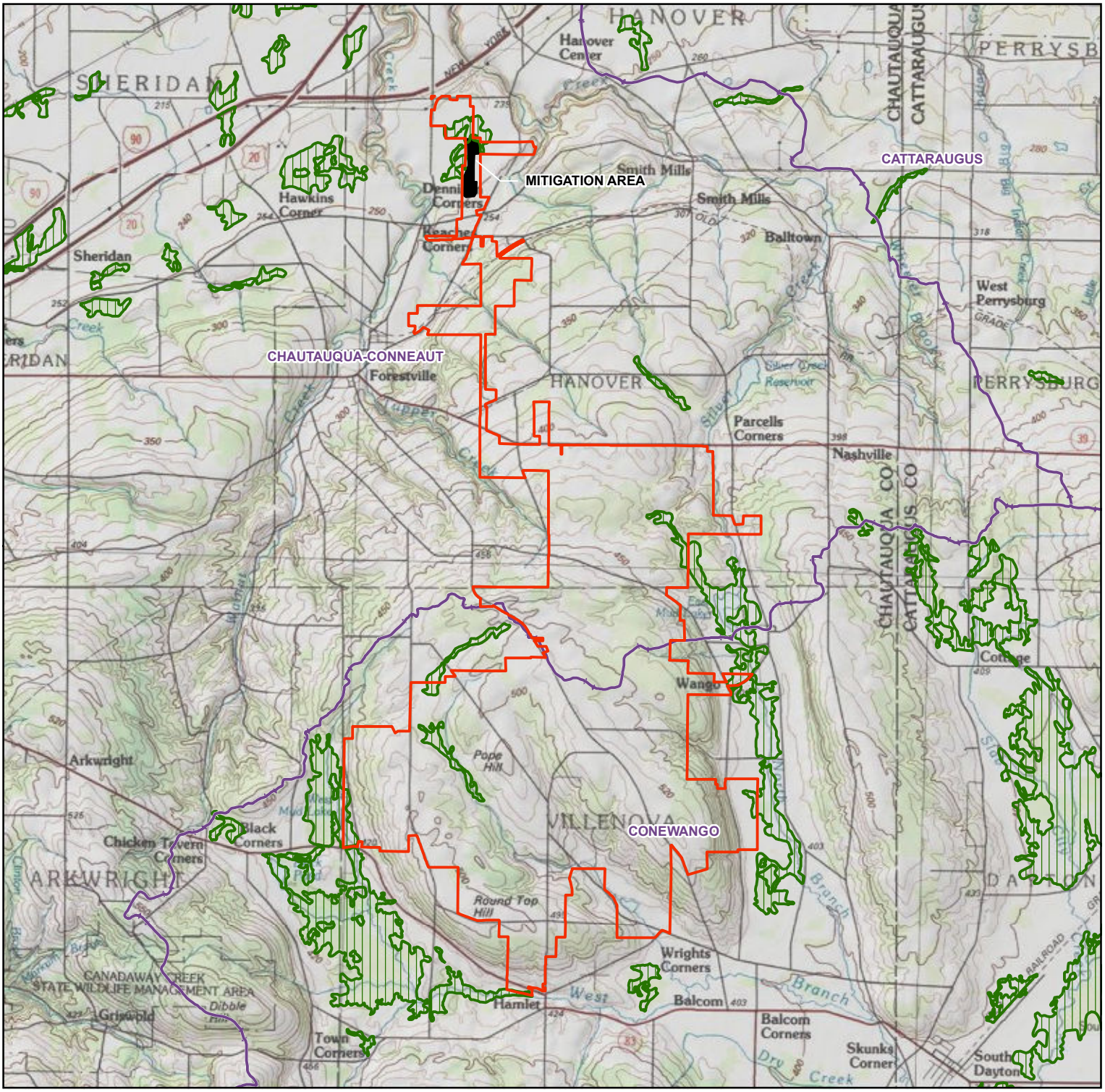
A maintenance and monitoring plan will be developed and implemented to ensure the vitality and functional integrity of the onsite mitigation area. This plan will include elements of vegetative monitoring, invasive species monitoring and control, and faunal monitoring. The goal of the wetland mitigation project is to enhance and preserve wetlands in the onsite mitigation area to mitigate for the wetlands that will be impacted by the Project. A stratified sampling plan will be developed in order to estimate percent cover and relative survival of the planted trees. The duration of monitoring will be developed with the regulatory agencies, but will likely extend over a five-year timeframe.

5.0 SCHEDULE

A Final Mitigation Plan, containing the final location of the proposed mitigation area and the Implementation Plan will be submitted to NYSDEC and the USACE prior to permit issuance. Preconstruction design activities for the onsite mitigation area will be initiated upon approval of a proposed mitigation approach. Planting of the onsite mitigation area is expected to proceed concurrently with the construction of the Project.

Ball Hill will also obtain the appropriate mitigation credits required to offset the anticipated impacts to wetlands under the jurisdiction of the USACE. A credit sale letter will be provided to the USACE prior to construction.

Figures



Project USGS Quad(s): Silver Creek, Forestville, Perrysburg	Project Watershed(s): Chautauqua-Conneaut (HUC 04120101) Conewango (HUC 05010002)	Project Study Limits: 665.38 Acres Center of Project Study Limits: 42.440 N, -79.128 W North American Datum 1983

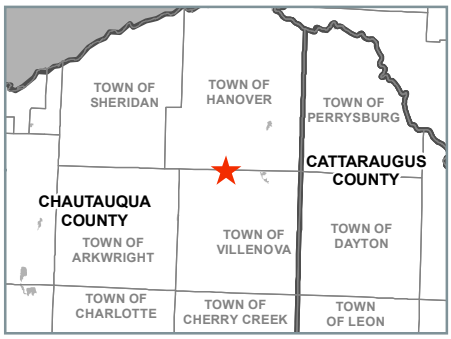
- Project Boundary
- Potential Mitigation Area
- NYSDEC Wetland
- Watershed Boundary

Data Sources:

United States Geological Survey 24k Topo Quad Map - usgs.gov

Author: AK

Revision Date: 10/14/2016



0 0.75 1.5 Miles

FISHER ASSOCIATES

BALL HILL WIND ENERGY, LLC.
BILL HILL WIND PROJECT
MITIGATION AREA LOCATION MAP

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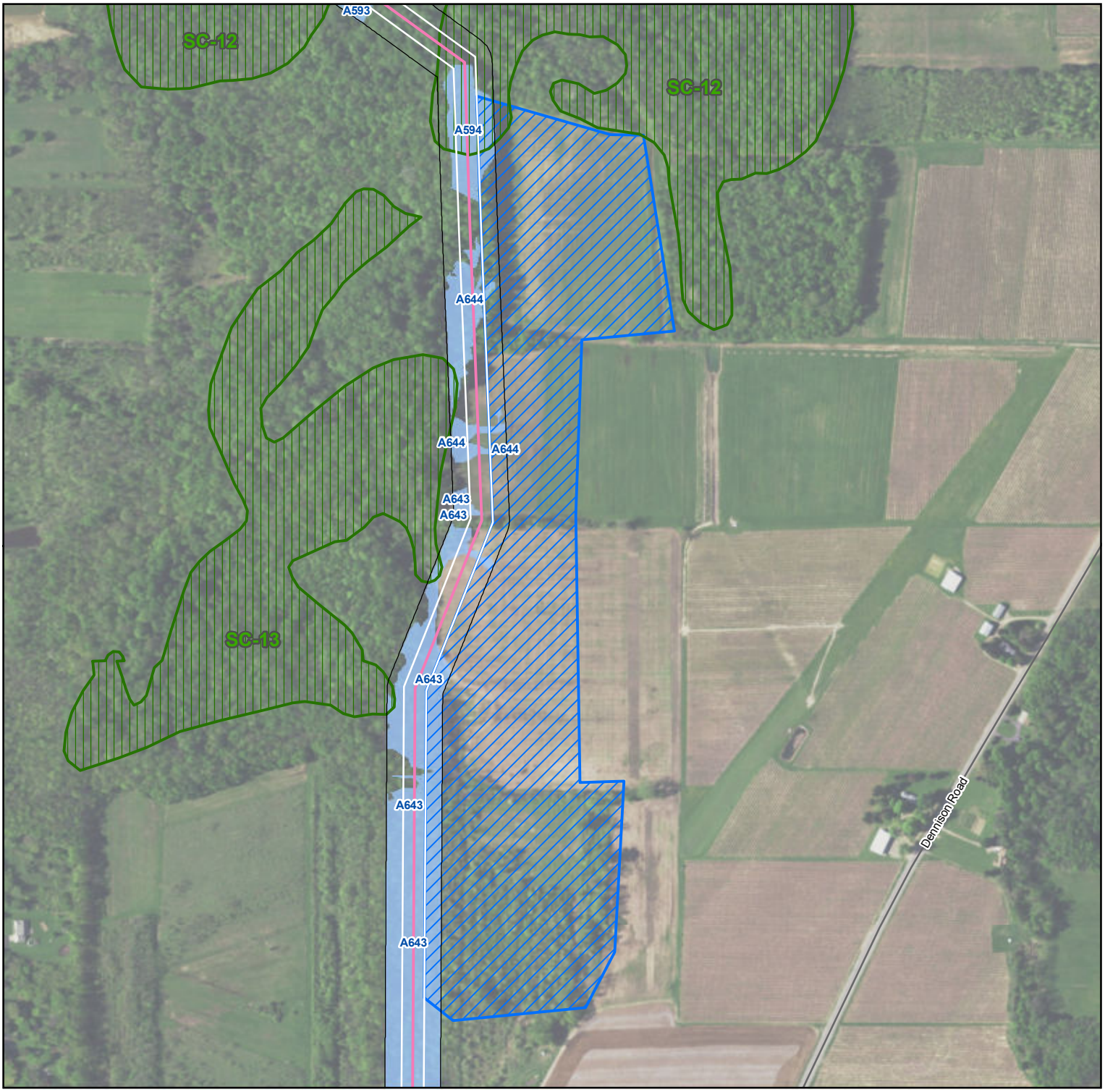
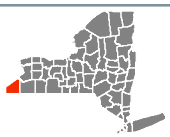


Project USGS Quad(s): Silver Creek, Forestville	Project Watershed(s): Chautauqua-Conneaut (HUC 04120101) Conewango (HUC 05010002)	Project Study Limits: 665.38 Acres Center of Project Study Limits: 42.440 N, -79.128 W North American Datum 1983

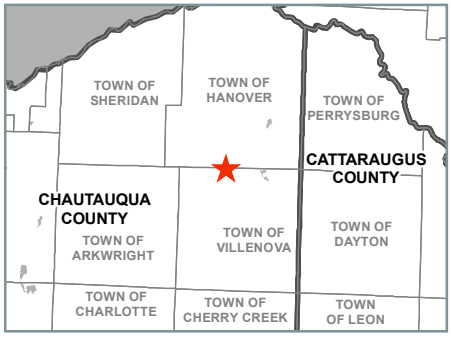


Road
Transmission Line
Delineated Wetland
Potential Mitigation Area
Right of Way
Project Study Limits
NYSDEC Wetland

Data Sources:

United States Geological Survey 24k Topo Quad Map - usgs.gov

Author: AK | Revision Date: 10/14/2016



0 0.045 0.09 Miles

FISHER ASSOCIATES

BALL HILL WIND ENERGY, LLC.
BILL HILL WIND PROJECT
PROPOSED ONSITE MITIGATION AREA

J:\Projects\150001-Ball_Hill_Wind_ENV\GIS\Ball_Hill_Mitigation_Area_Map.mxd - 2:03:14 PM

G Agency Correspondence

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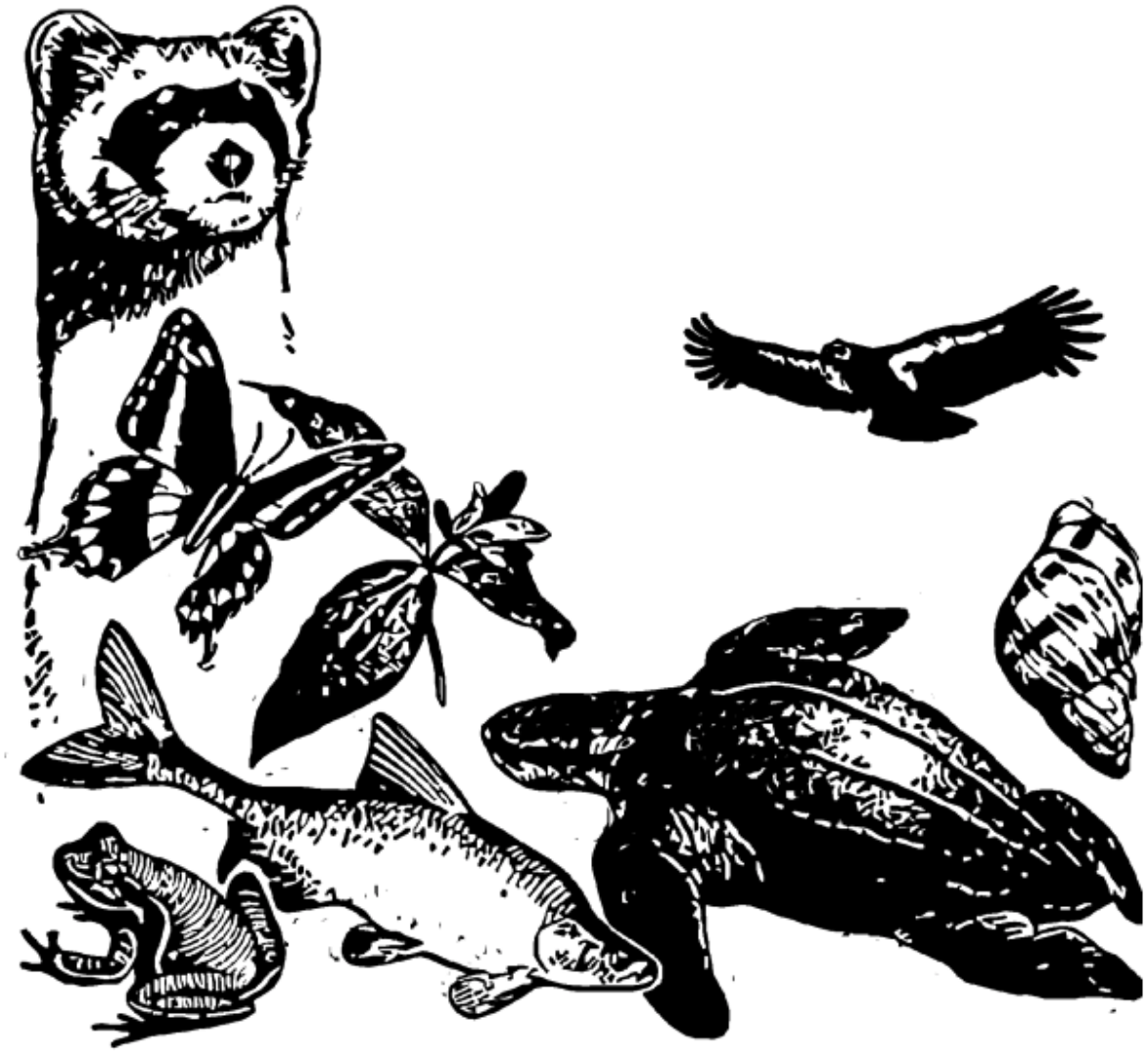
G-1 United States Fish and Wildlife Service

U.S. Fish & Wildlife Service

IPaC Trust Resources Report

Generated August 16, 2016 10:27 AM MDT, IPaC v3.0.8

This report is for informational purposes only and should not be used for planning or analyzing project level impacts. For project reviews that require U.S. Fish & Wildlife Service review or concurrence, please return to the IPaC website and request an official species list from the Regulatory Documents page.



IPaC - Information for Planning and Conservation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish & Wildlife Service environmental review process.

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IPaC Trust Resources Report 1
Project Description 1
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Migratory Birds 3
Refuges & Hatcheries 5
Wetlands 6

U.S. Fish & Wildlife Service

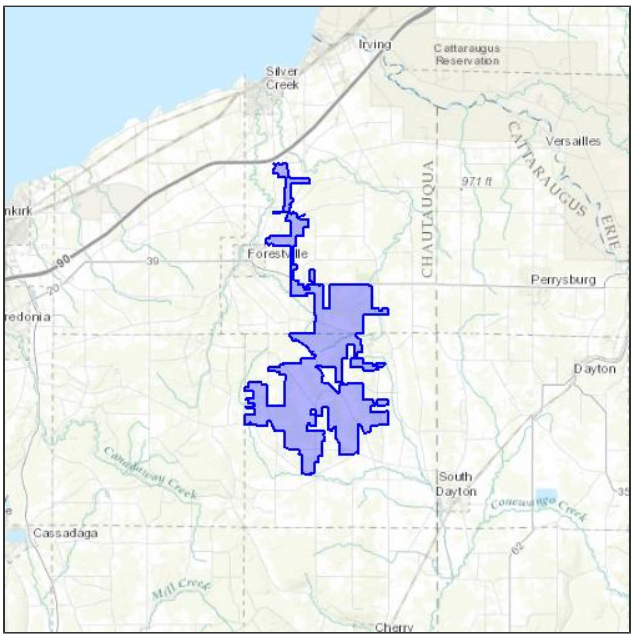
IPaC Trust Resources Report

LOCATION

Chautauqua County, New York

IPAC LINK

https://ecos.fws.gov/ipac/project/4GMLN-XZFPJ-D63LR-FZTZM-ZBRFRA



U.S. Fish & Wildlife Service Contact Information

Trust resources in this location are managed by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9349
(607) 753-9334

Endangered Species

Proposed, candidate, threatened, and endangered species are managed by the Endangered Species Program of the U.S. Fish & Wildlife Service.

This USFWS trust resource report is for informational purposes only and should not be used for planning or analyzing project level impacts.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list from the Regulatory Documents section.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can only be obtained by requesting an official species list either from the Regulatory Documents section in IPaC or from the local field office directly.

The list of species below are those that may occur or could potentially be affected by activities in this location:

Mammals

Northern Long-eared Bat Myotis septentrionalis — Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=A0JE

Reptiles

Bog (=muhlenberg) Turtle Clemmys muhlenbergii — Threatened

CRITICAL HABITAT

No critical habitat has been designated for this species.

http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=C048

Critical Habitats

There are no critical habitats in this location

Migratory Birds

Birds are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish & Wildlife Service.[1] There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures.

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1. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern
  http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Conservation measures for birds
  http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Year-round bird occurrence data
  http://www.birdscanada.org/birdmon/default/datasummaries.jsp

The following species of migratory birds could potentially be affected by activities in this location:

American Bittern Botaurus lentiginosus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F3

Bald Eagle Haliaeetus leucocephalus — Bird of conservation concern
Season: Year-round
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B008

Black-billed Cuckoo Coccyzus erythropthalmus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HI

Black-crowned Night-heron Nycticorax nycticorax — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0EU

Blue-winged Warbler Vermivora pinus — Bird of conservation concern
Season: Breeding

Canada Warbler Wilsonia canadensis — Bird of conservation concern
Season: Breeding

Common Tern Sterna hirundo — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B09G

Golden-winged Warbler Vermivora chrysoptera — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0G4

Least Bittern Ixobrychus exilis
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B092

Olive-sided Flycatcher Contopus cooperi — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0AN

Peregrine Falcon Falco peregrinus — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0FU

Pied-billed Grebe Podilymbus podiceps — Bird of conservation concern
Season: Breeding

Red-headed Woodpecker Melanerpes erythrocephalus — Bird of conservation concern
Season: Breeding

Short-eared Owl Asio flammeus — Bird of conservation concern
Season: Wintering
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HD

Upland Sandpiper Bartramia longicauda — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0HC

Willow Flycatcher Empidonax traillii — Bird of conservation concern
Season: Breeding
http://ecos.fws.gov/tess_public/profile/speciesProfile.action?spcode=B0F6

Wood Thrush Hylocichla mustelina — Bird of conservation concern
Season: Breeding

Wildlife refuges and fish hatcheries

There are no refuges or fish hatcheries in this location

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

This location overlaps all or part of the following wetlands:

Freshwater Emergent Wetland

PEM5C
PEM5E

Freshwater Forested/shrub Wetland

PFO1/SS1C
PFO1/SS1E

PFO1A
PFO1C
PFO1E
PFO4/1C
PFO5Hb
PFO5Hh
PSS1C
PSS1E

Freshwater Pond

PUBH
PUBHh
PUBHx

Riverine

R3UBH
R4SBC
R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website: http://107.20.228.18/decoders/wetlands.aspx

G-2 Federal Aviation Administration

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8079-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T1
Location:	Hamlet, NY
Latitude:	42-23-56.89N NAD 83
Longitude:	79-10-13.11W
Heights:	1519 feet site elevation (SE)
	499 feet above ground level (AGL)
	2018 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2018 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8079-OE.

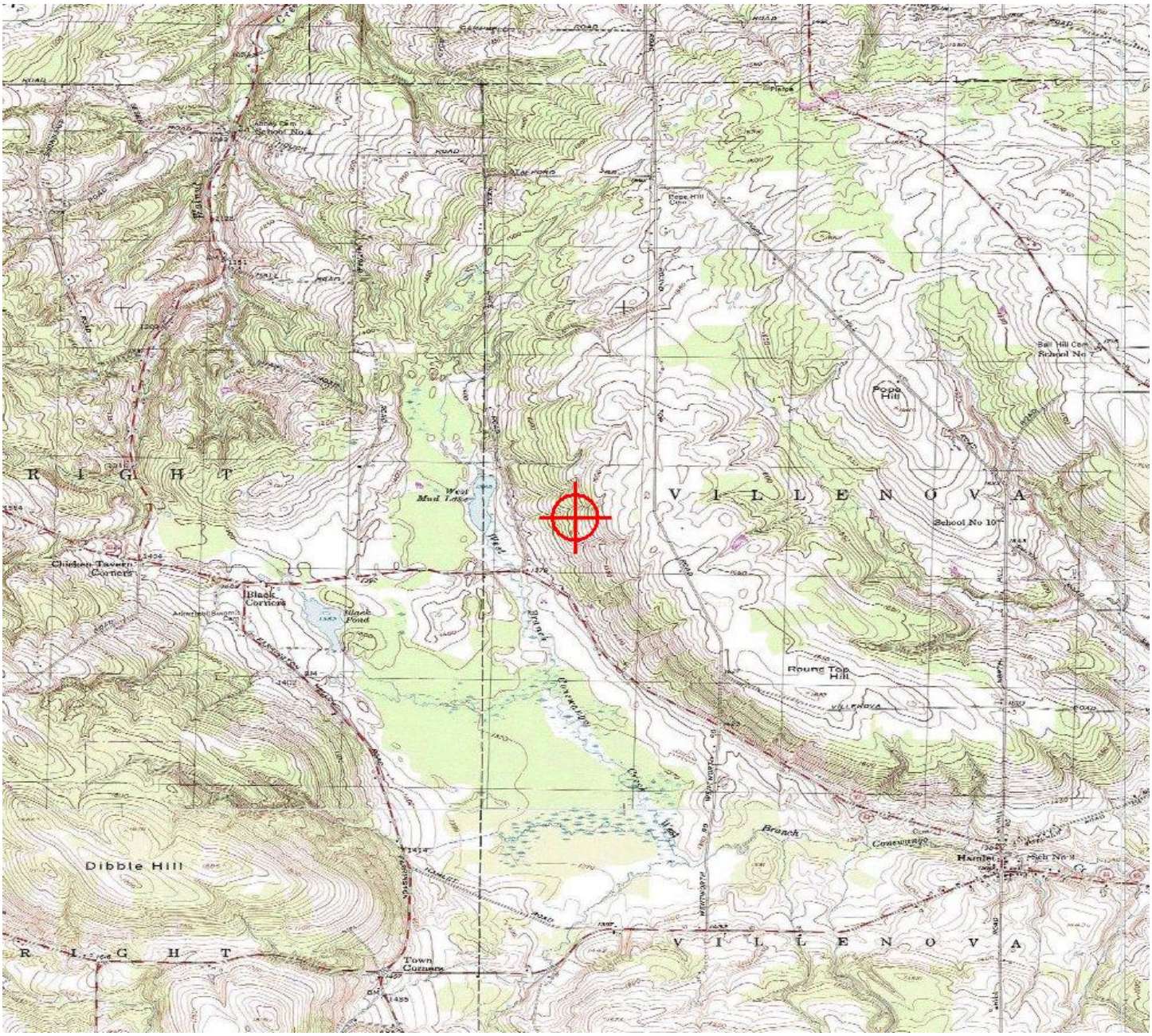
Signature Control No: 273432842-301612340 (DNE -WT)
Brenda Mumper
Specialist

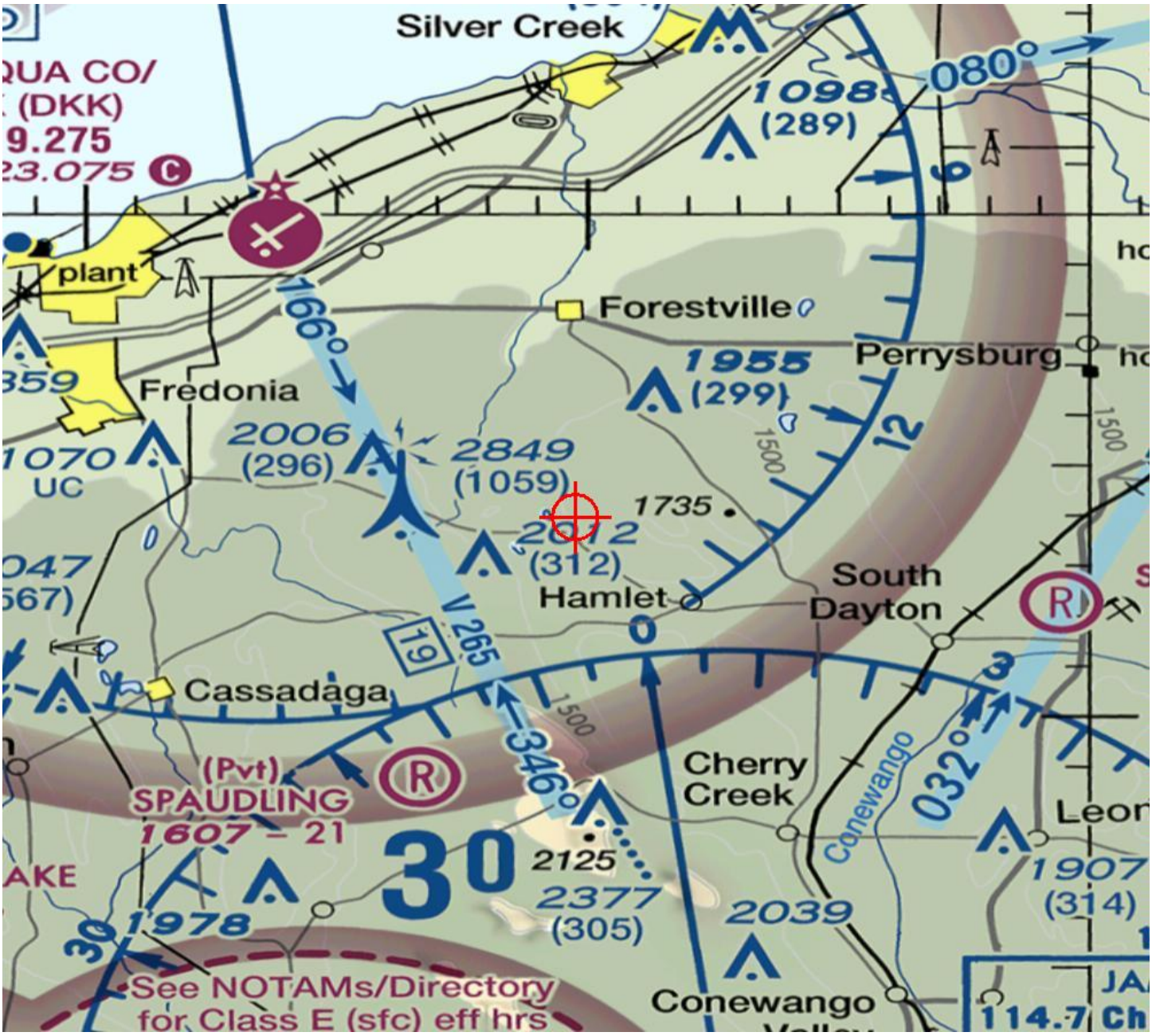
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8079-OE




Silver Creek
(DKK)
9.275
23.075
plant
Forestville
Perrysburg
Fredonia
1098
(289)
080°
166°
1955
(299)
2006
(296)
2849
(1059)
1070
UC
1735
2872
(312)
Hamlet
South
Dayton
V 265
Cassadaga
346°
Cherry
Creek
032°
Conewango
(Pvt)
SPAUDLING
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30
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2377
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1978
2039
1907
(314)
See NOTAMs/Directory
for Class E (sfc) eff hrs
Conewango
114.7

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8080-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T2
Location:	Hamlet, NY
Latitude:	42-24-42.29N NAD 83
Longitude:	79-10-17.74W
Heights:	1541 feet site elevation (SE)
	499 feet above ground level (AGL)
	2040 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2040 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

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If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8080-OE.

Signature Control No: 273432843-301612352 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

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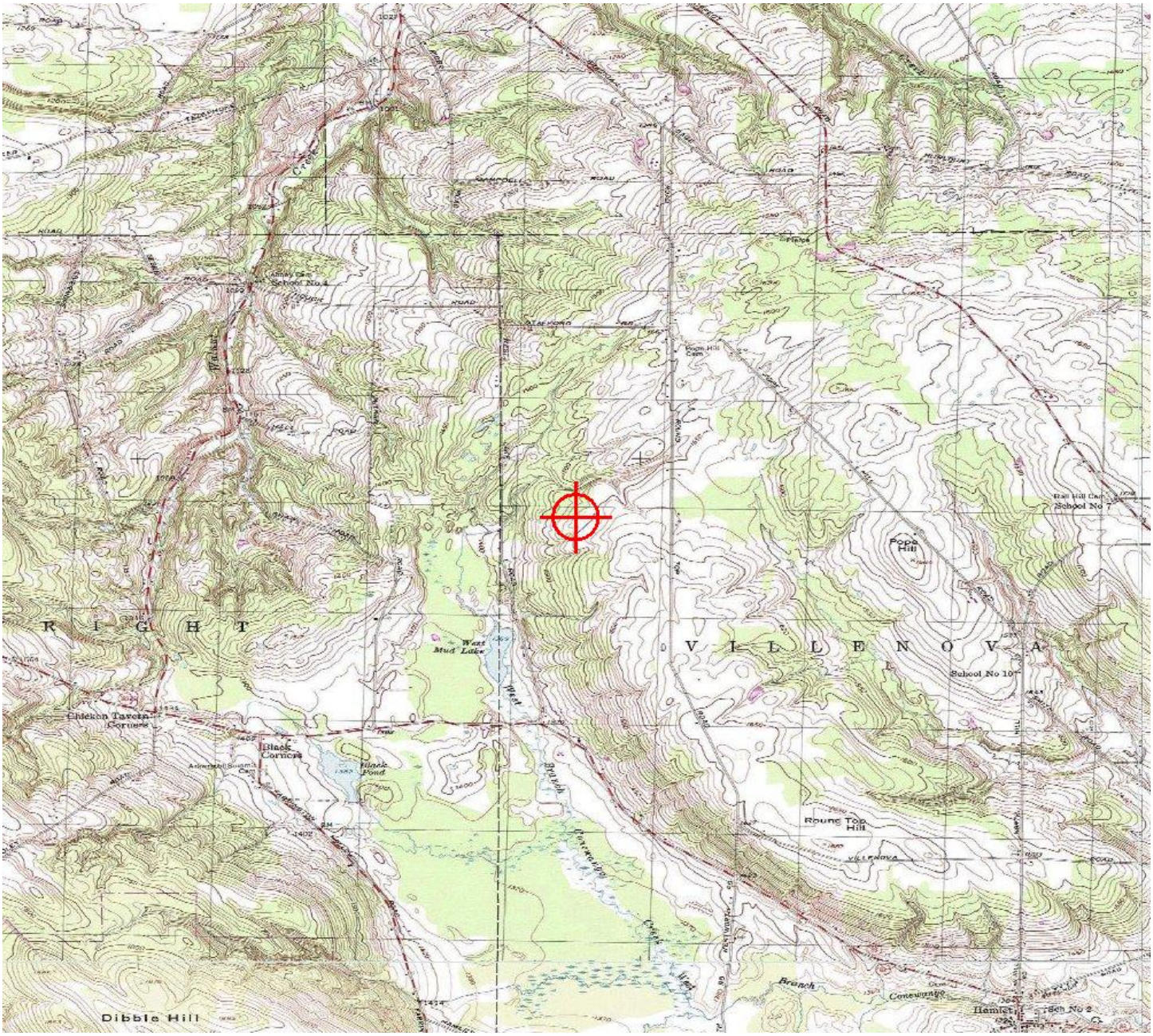
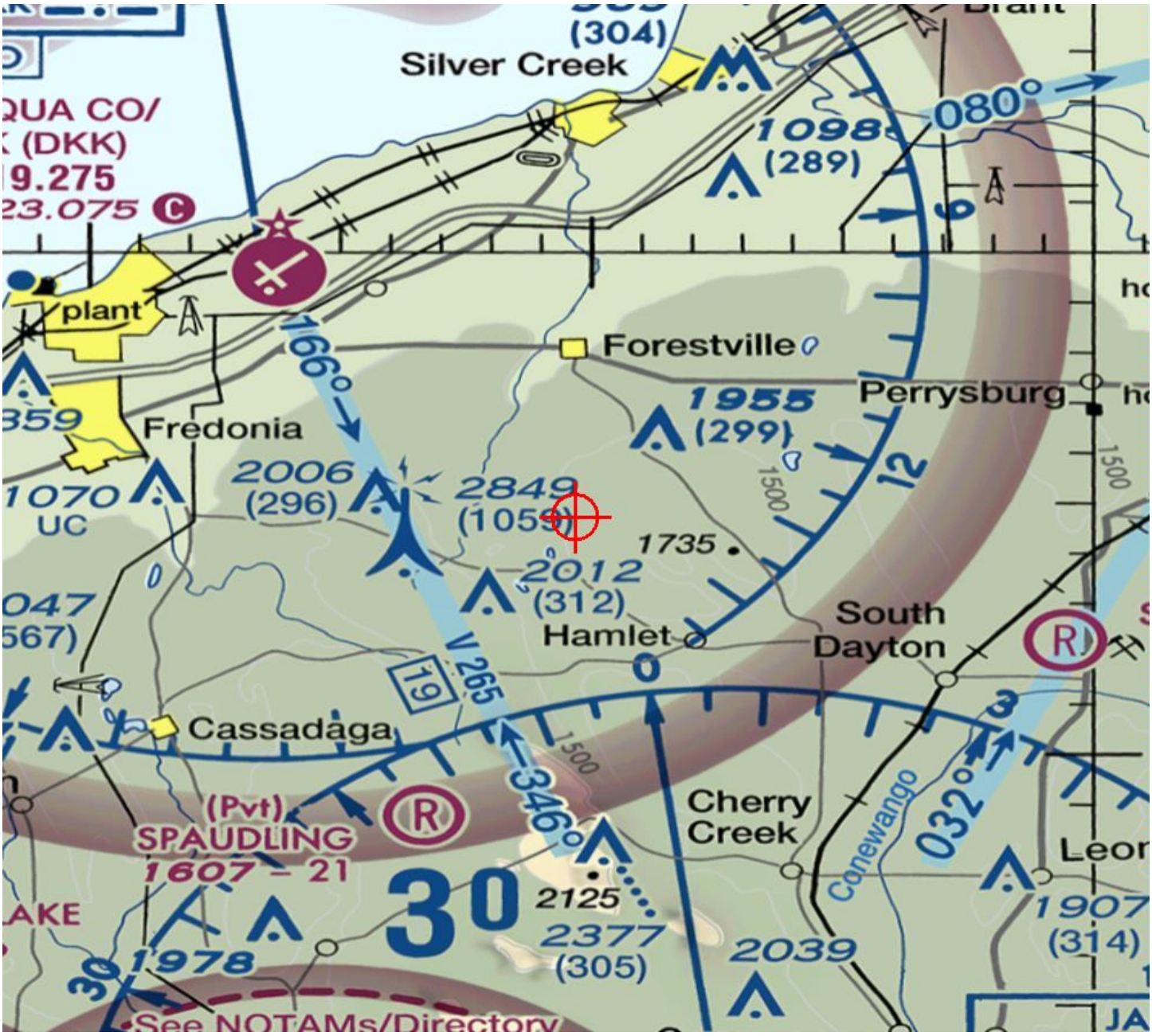
TOPO Map for ASN 2015-WTE-8080-OE



Sectional Map for ASN 2015-WTE-8080-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8081-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T3
Location:	Hamlet, NY
Latitude:	42-22-48.64N NAD 83
Longitude:	79-08-19.95W
Heights:	1618 feet site elevation (SE)
	499 feet above ground level (AGL)
	2117 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
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See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2117 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8081-OE.

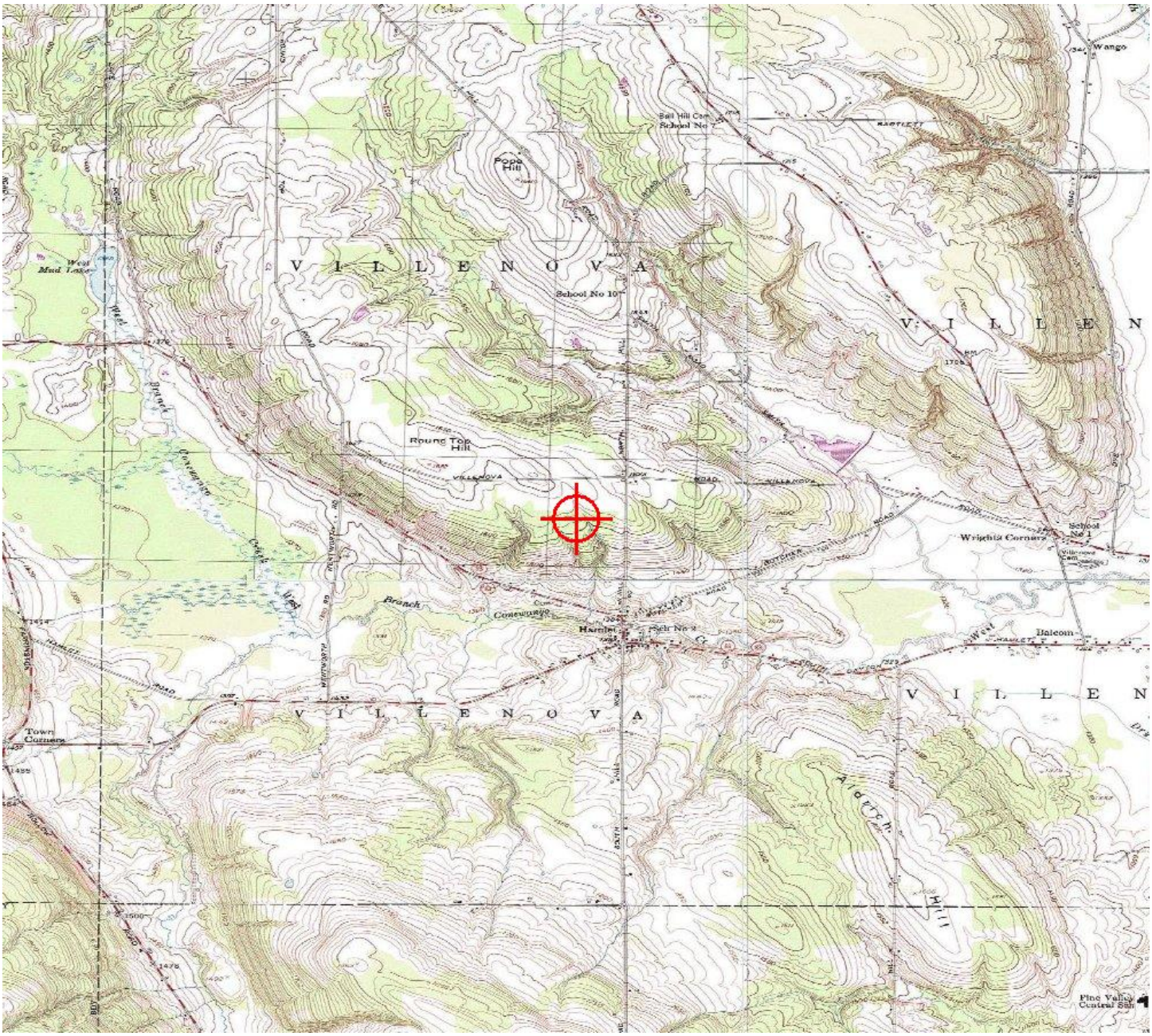
Signature Control No: 273432844-301612339 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8081-OE



Sectional Map for ASN 2015-WTE-8081-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8082-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T4
Location:	Hamlet, NY
Latitude:	42-23-08.19N NAD 83
Longitude:	79-08-29.54W
Heights:	1632 feet site elevation (SE)
	499 feet above ground level (AGL)
	2131 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2131 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8082-OE.

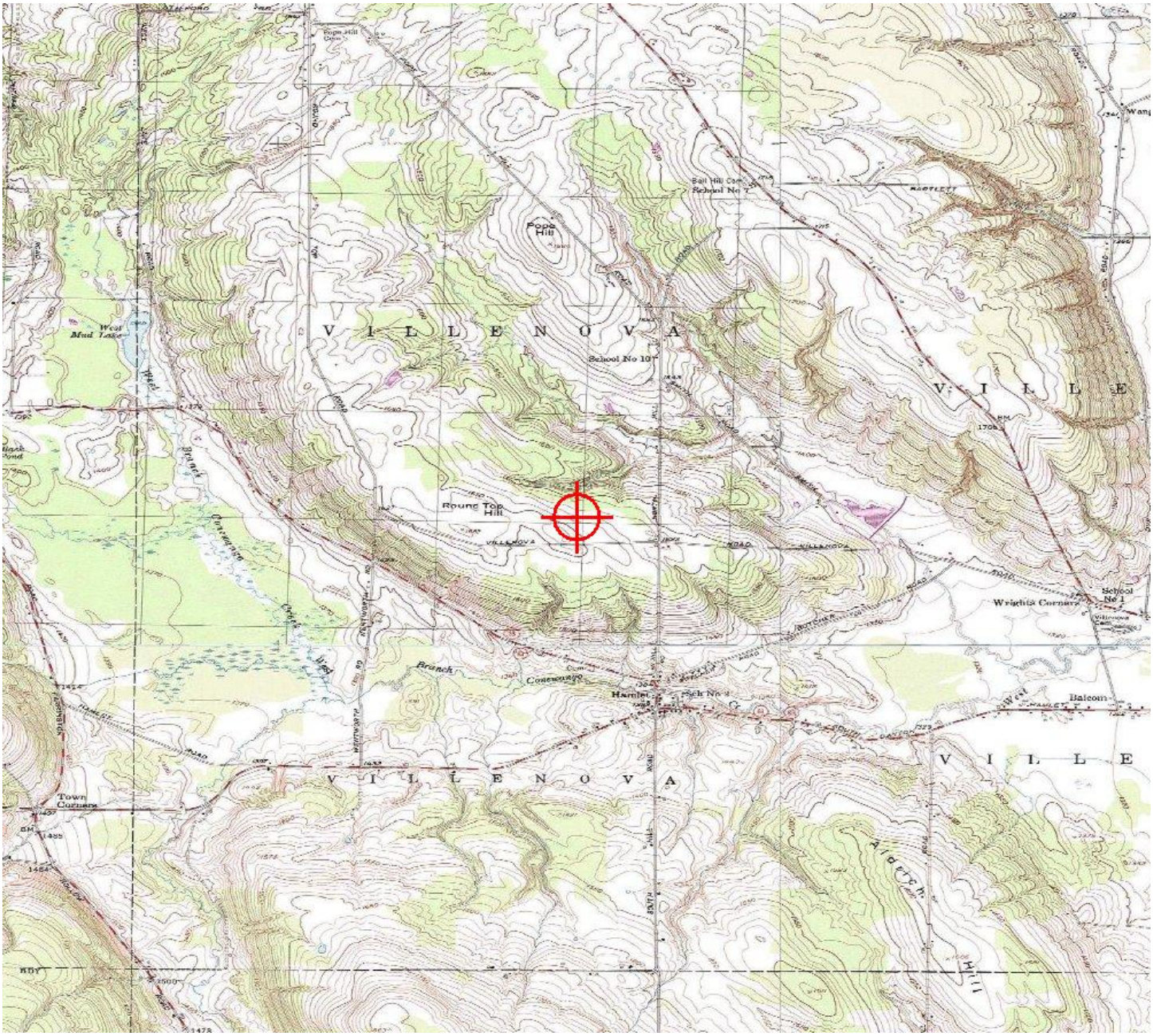
Signature Control No: 273432845-301612342 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8082-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8083-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T5
Location:	Hamlet, NY
Latitude:	42-23-22.69N NAD 83
Longitude:	79-08-46.67W
Heights:	1631 feet site elevation (SE)
	499 feet above ground level (AGL)
	2130 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2130 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8083-OE.

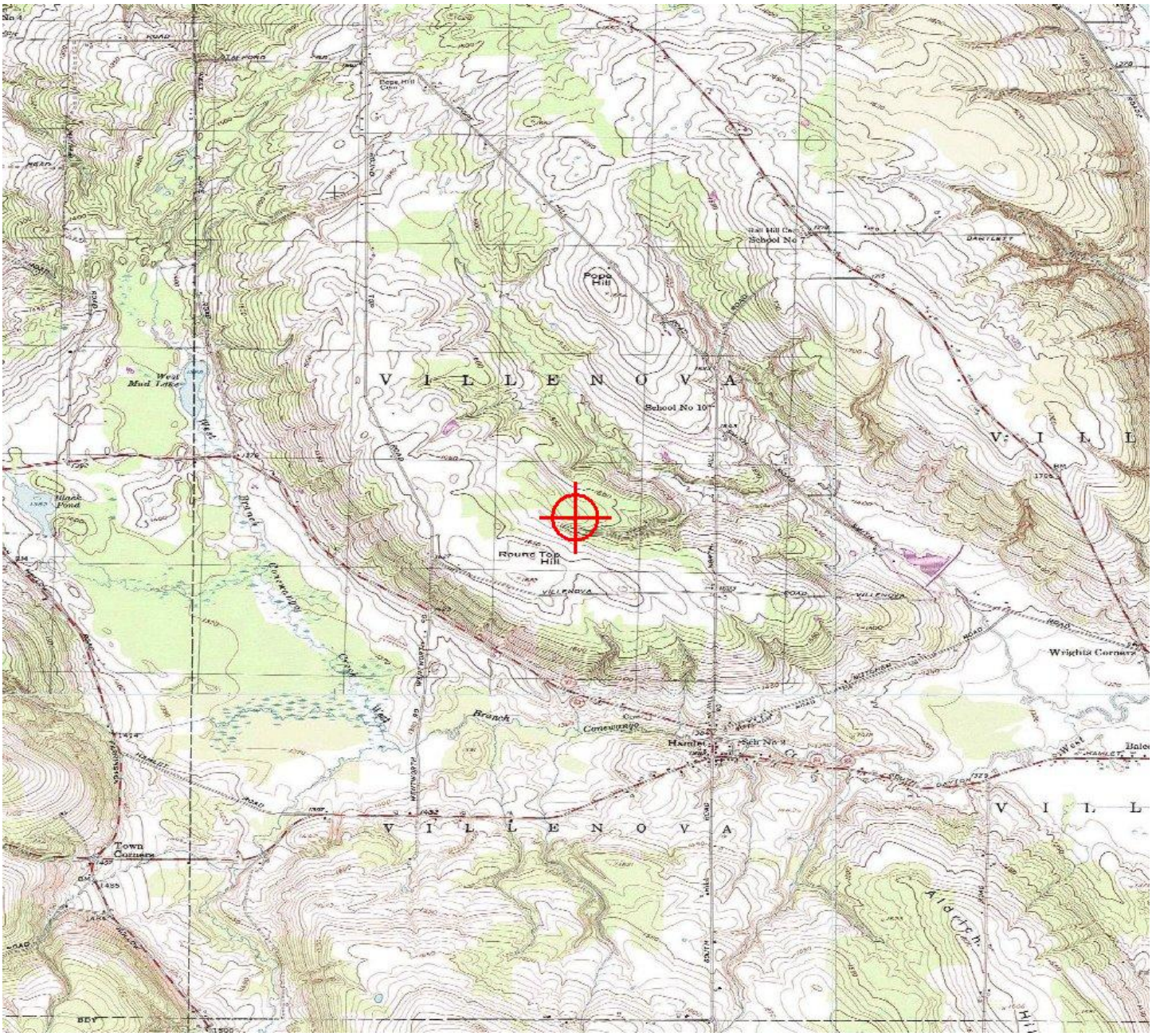
Signature Control No: 273432846-301612350 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8083-OE



Sectional Map for ASN 2015-WTE-8083-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8084-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T6
Location:	Hamlet, NY
Latitude:	42-23-34.10N NAD 83
Longitude:	79-08-54.31W
Heights:	1622 feet site elevation (SE)
	499 feet above ground level (AGL)
	2121 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2121 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8084-OE.

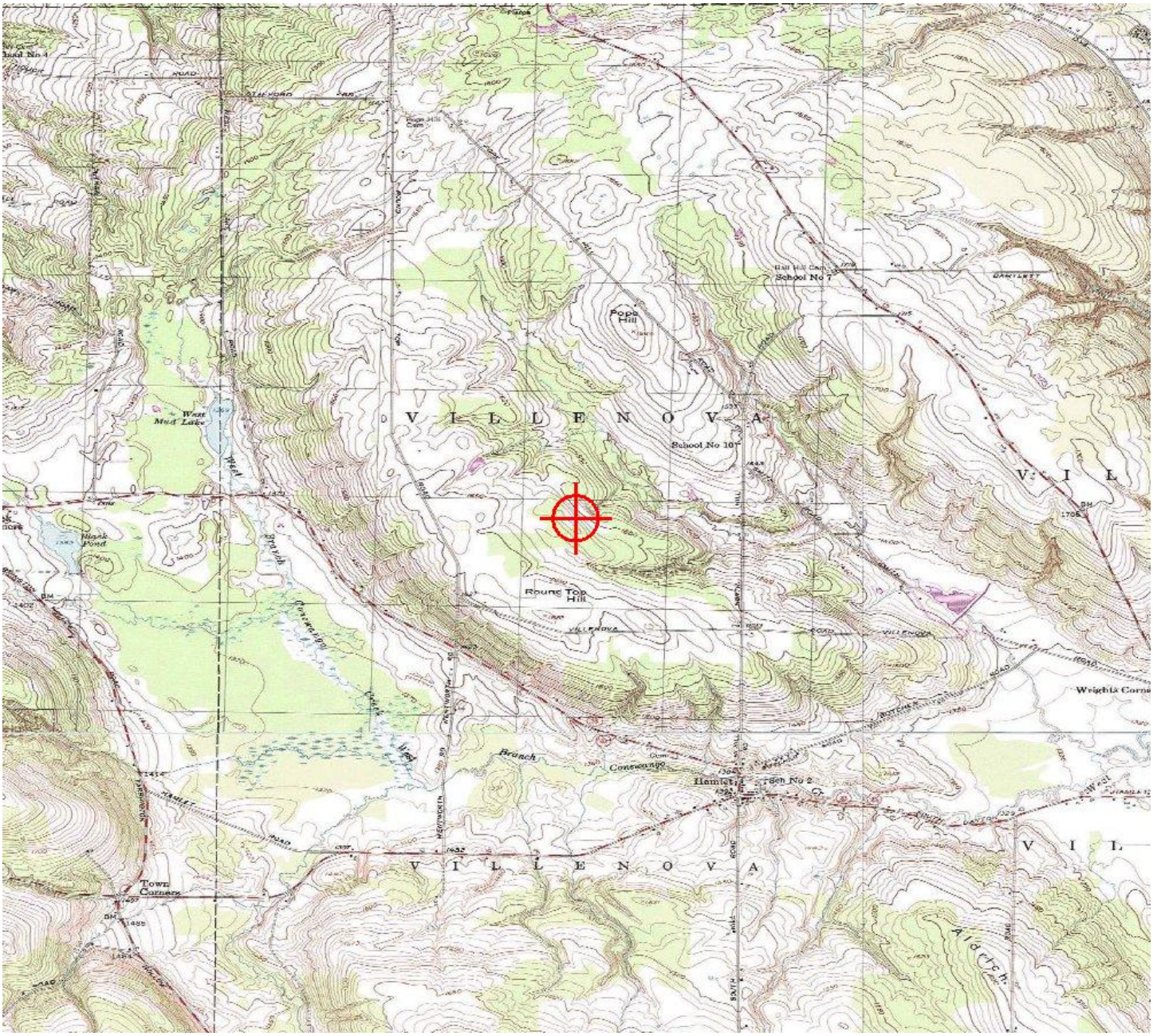
Signature Control No: 273432847-301612348 (DNE -WT)
Brenda Mumper
Specialist

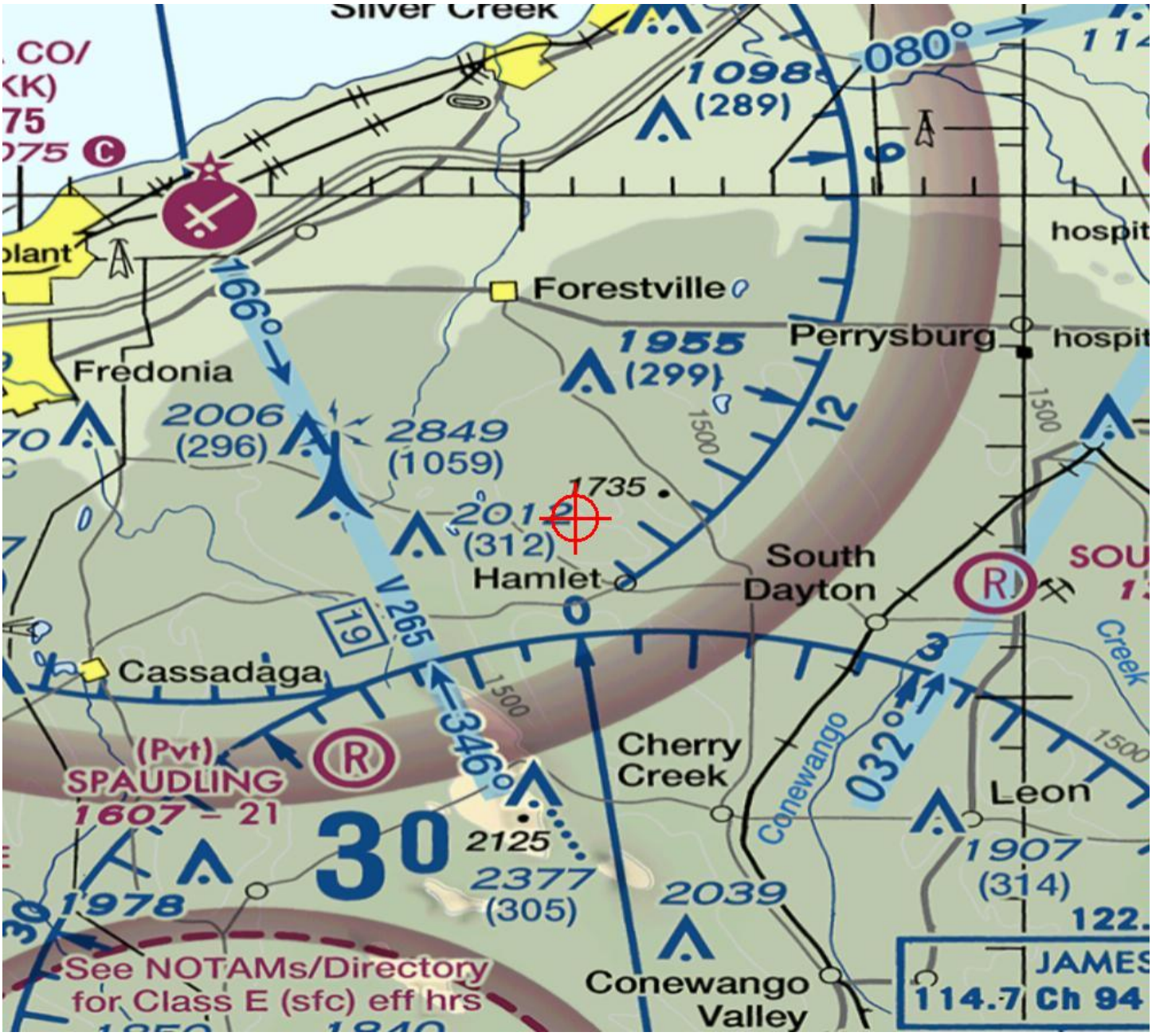
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8084-OE

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2377
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for Class E (sfc) eff hrs
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JAMES
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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8085-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T7
Location:	Hamlet, NY
Latitude:	42-23-47.93N NAD 83
Longitude:	79-09-01.51W
Heights:	1605 feet site elevation (SE)
	499 feet above ground level (AGL)
	2104 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2104 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8085-OE.

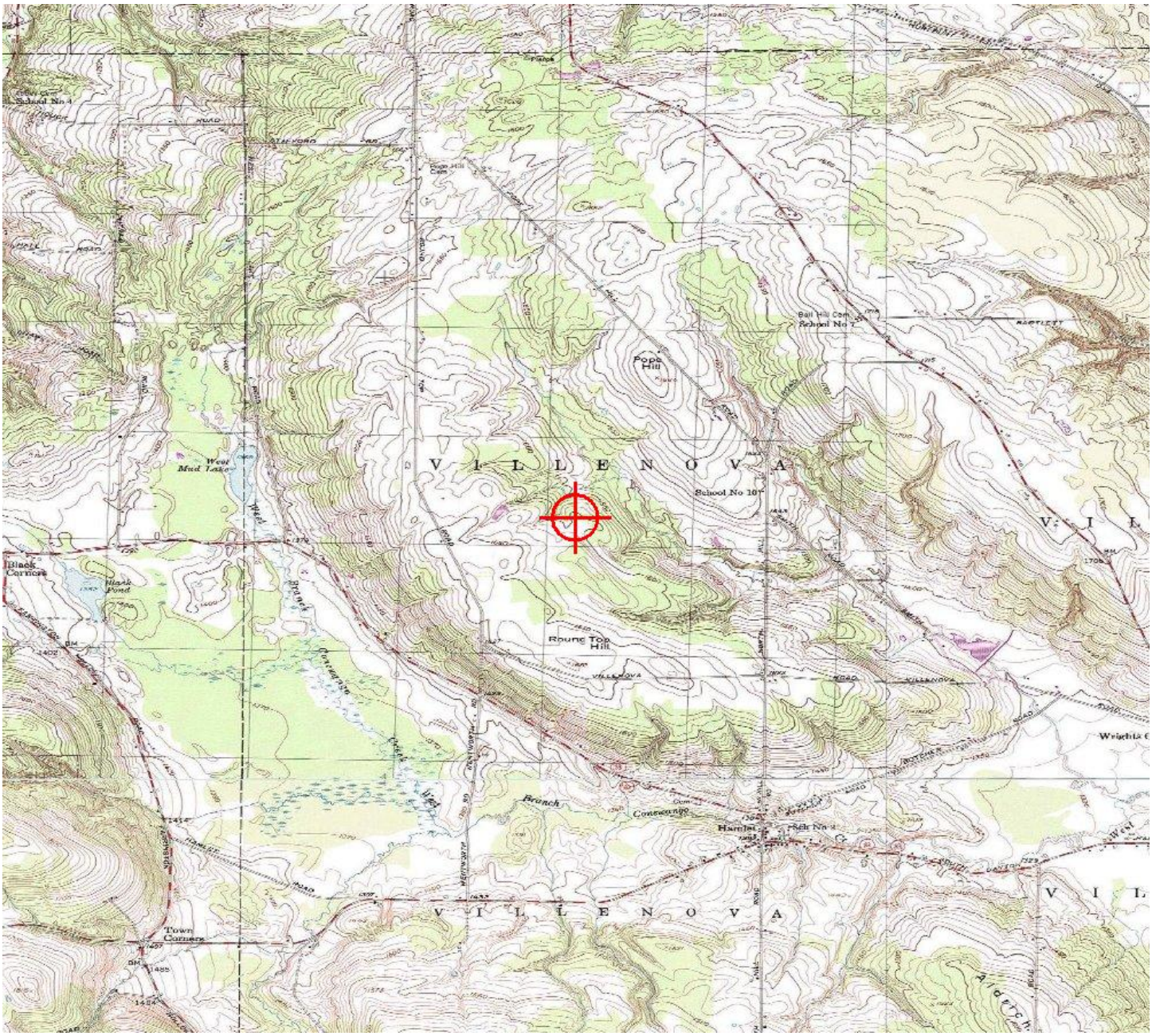
Signature Control No: 273432848-301612355 (DNE -WT)
Brenda Mumper
Specialist

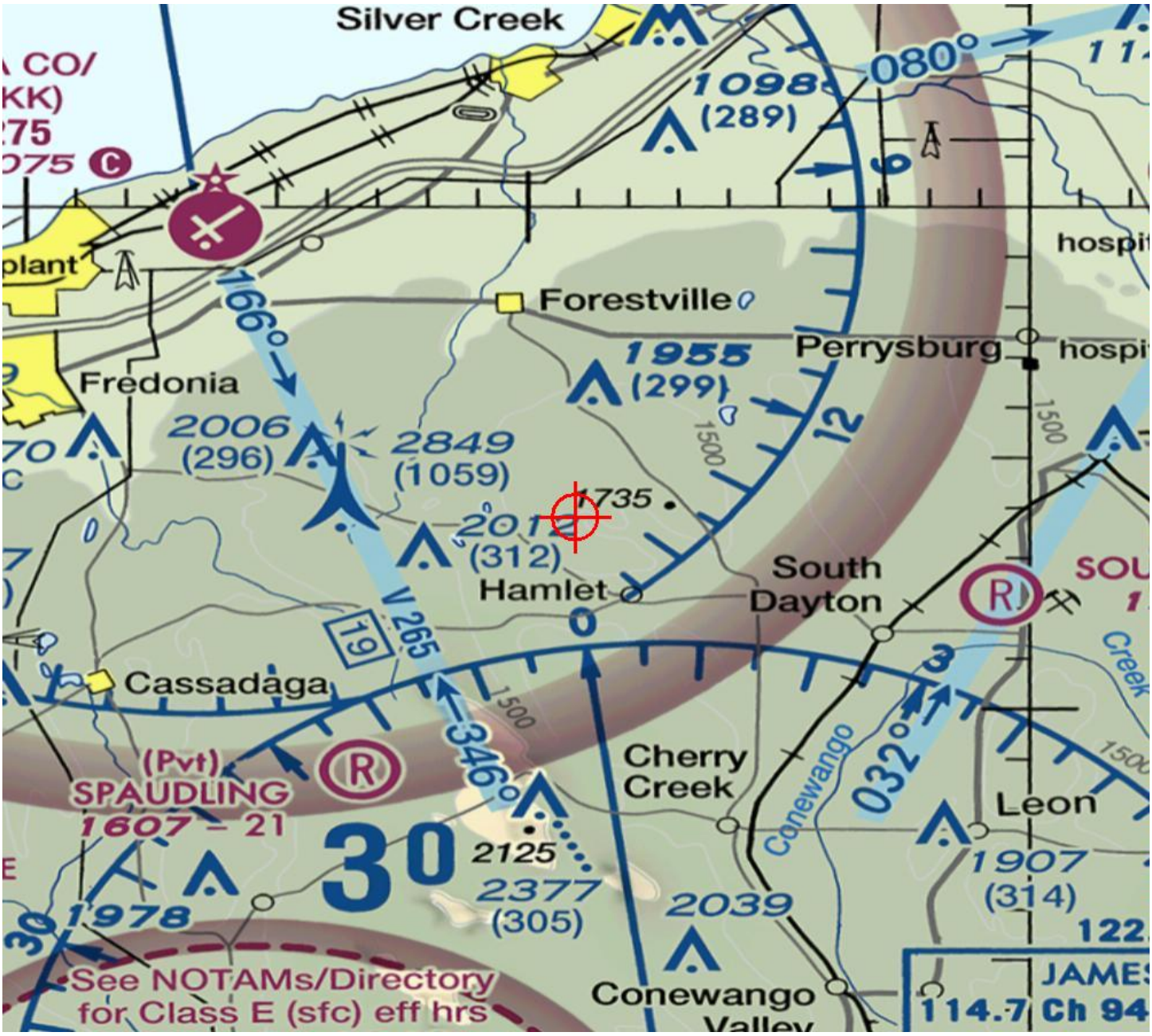
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8085-OE

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(289)
080°
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1955
(299)
Fredonia
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(296)
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2012
(312)
Hamlet
South
Dayton
V 265
19
Cassadaga
166°
346°
032°
Cherry
Creek
Conewango
Leon
1907
(314)
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SPAUDLING
1607 – 21
30
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1978
See NOTAMs/Directory
for Class E (sfc) eff hrs
Conewango
Valley
114.7
Ch 94
1500

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8086-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T8
Location:	Hamlet, NY
Latitude:	42-24-06.15N NAD 83
Longitude:	79-09-17.25W
Heights:	1605 feet site elevation (SE)
	499 feet above ground level (AGL)
	2104 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2104 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8086-OE.

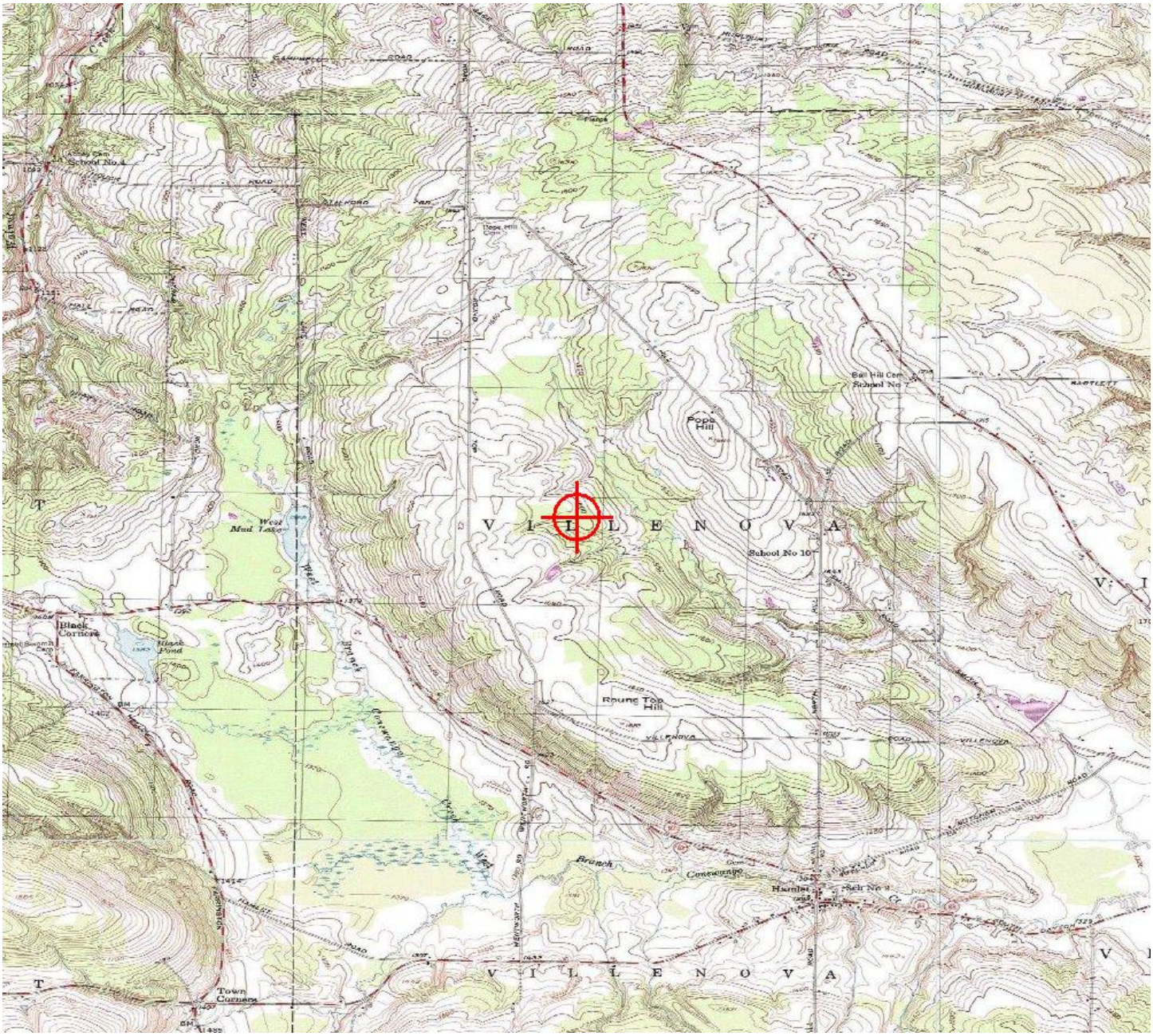
Signature Control No: 273432850-301612344 (DNE -WT)
Brenda Mumper
Specialist

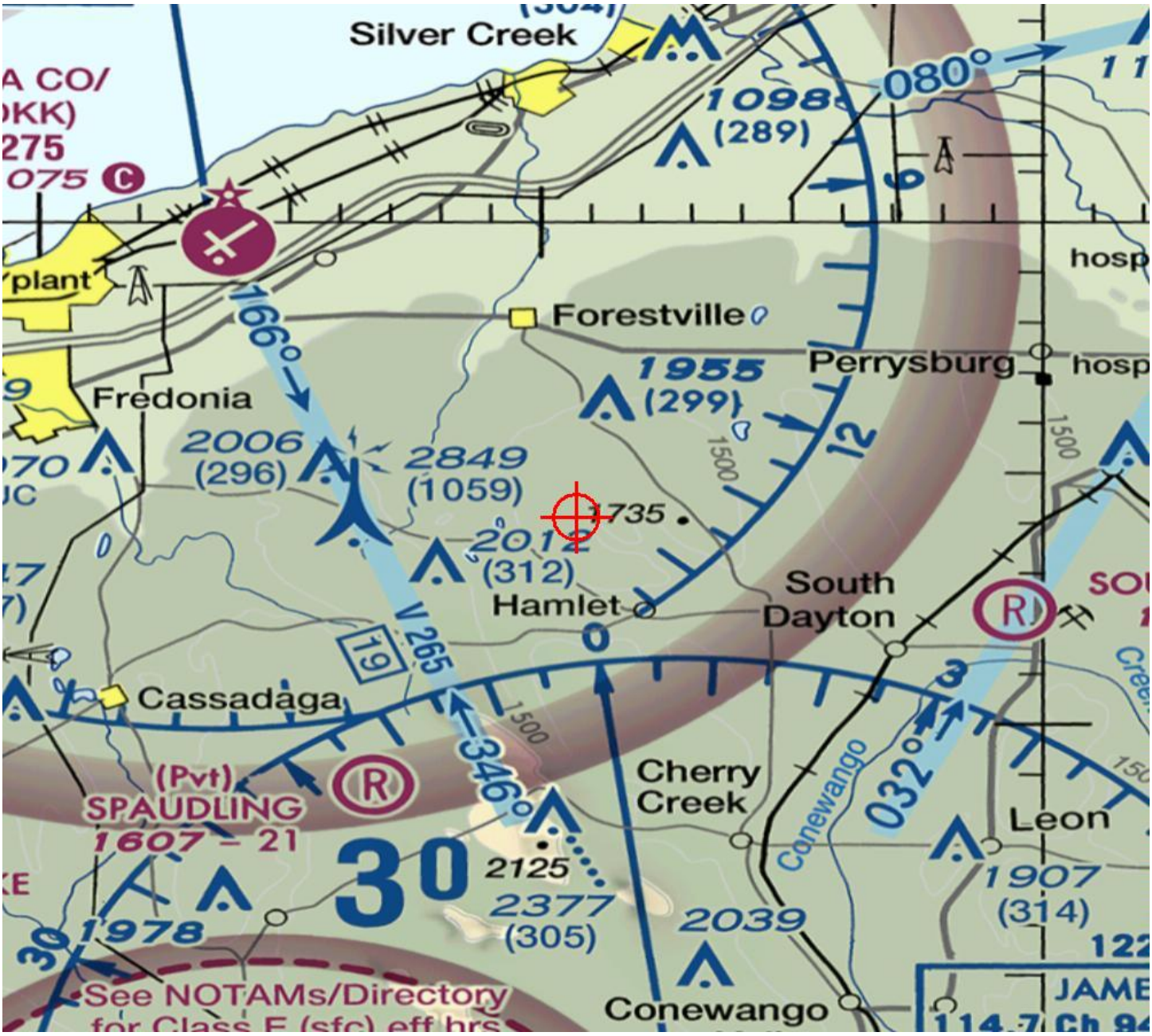
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8086-OE




Silver Creek
080°
1098
(289)
Forestville
Perrysburg
hosp
166°
1955
(299)
Fredonia
2006
(296)
2849
(1059)
1735
2012
(312)
Hamlet
South
Dayton
V 265
19
Cassadaga
346°
Cherry
Creek
Conewango
032°
Leon
(Pvt)
SPAUDLING
1607 – 21
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2125
2377
(305)
1978
2039
1907
(314)
See NOTAMs/Directory
for Class E (sfc) eff hrs
Conewango

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8087-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T9
Location:	Hamlet, NY
Latitude:	42-23-56.70N NAD 83
Longitude:	79-08-28.54W
Heights:	1555 feet site elevation (SE)
	499 feet above ground level (AGL)
	2054 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2054 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8087-OE.

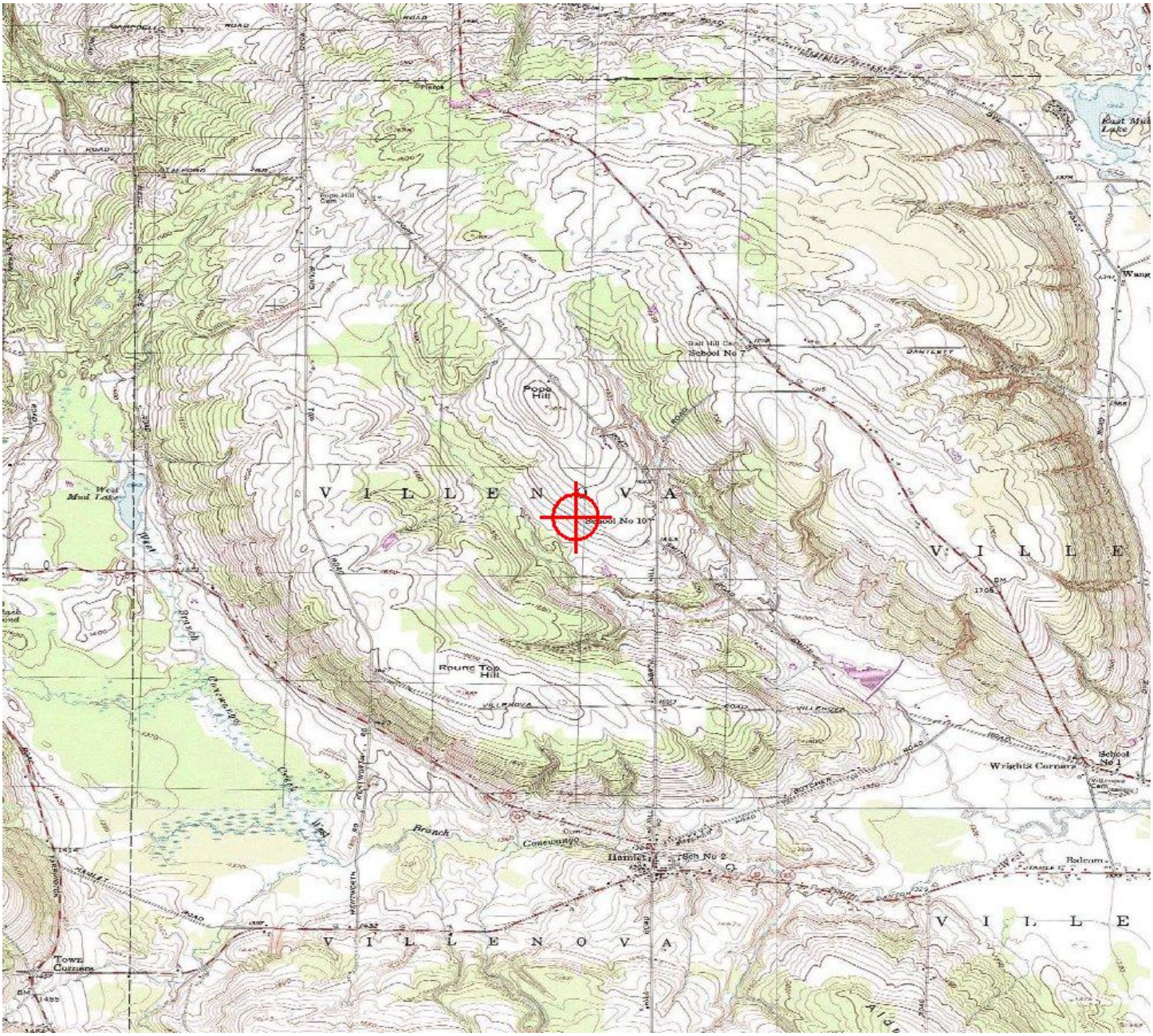
Signature Control No: 273432851-301612351 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

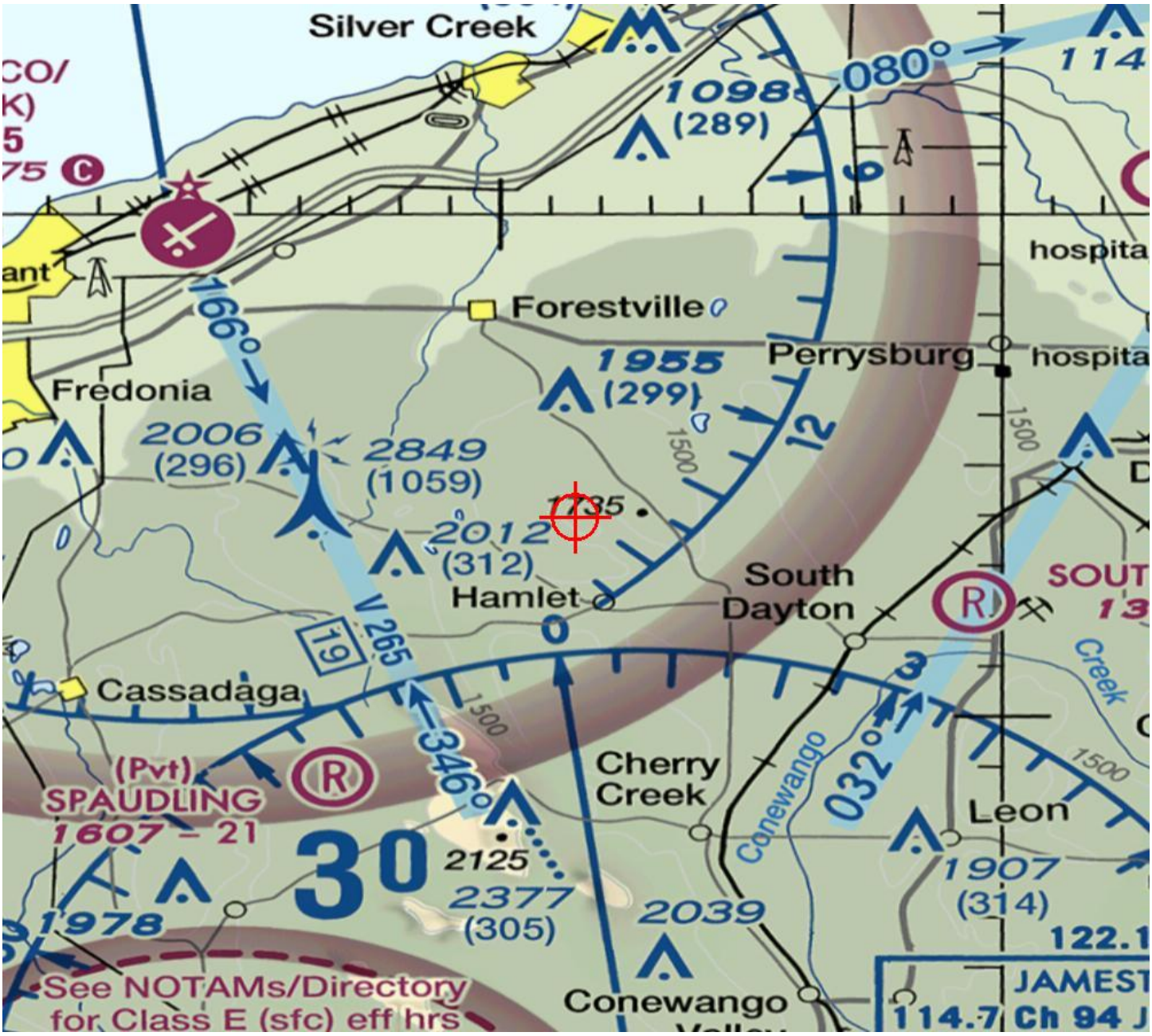
The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8087-OE



Sectional Map for ASN 2015-WTE-8087-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8088-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T11
Location:	Hamlet, NY
Latitude:	42-24-29.14N NAD 83
Longitude:	79-08-56.63W
Heights:	1590 feet site elevation (SE)
	499 feet above ground level (AGL)
	2089 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

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See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2089 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

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If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8088-OE.

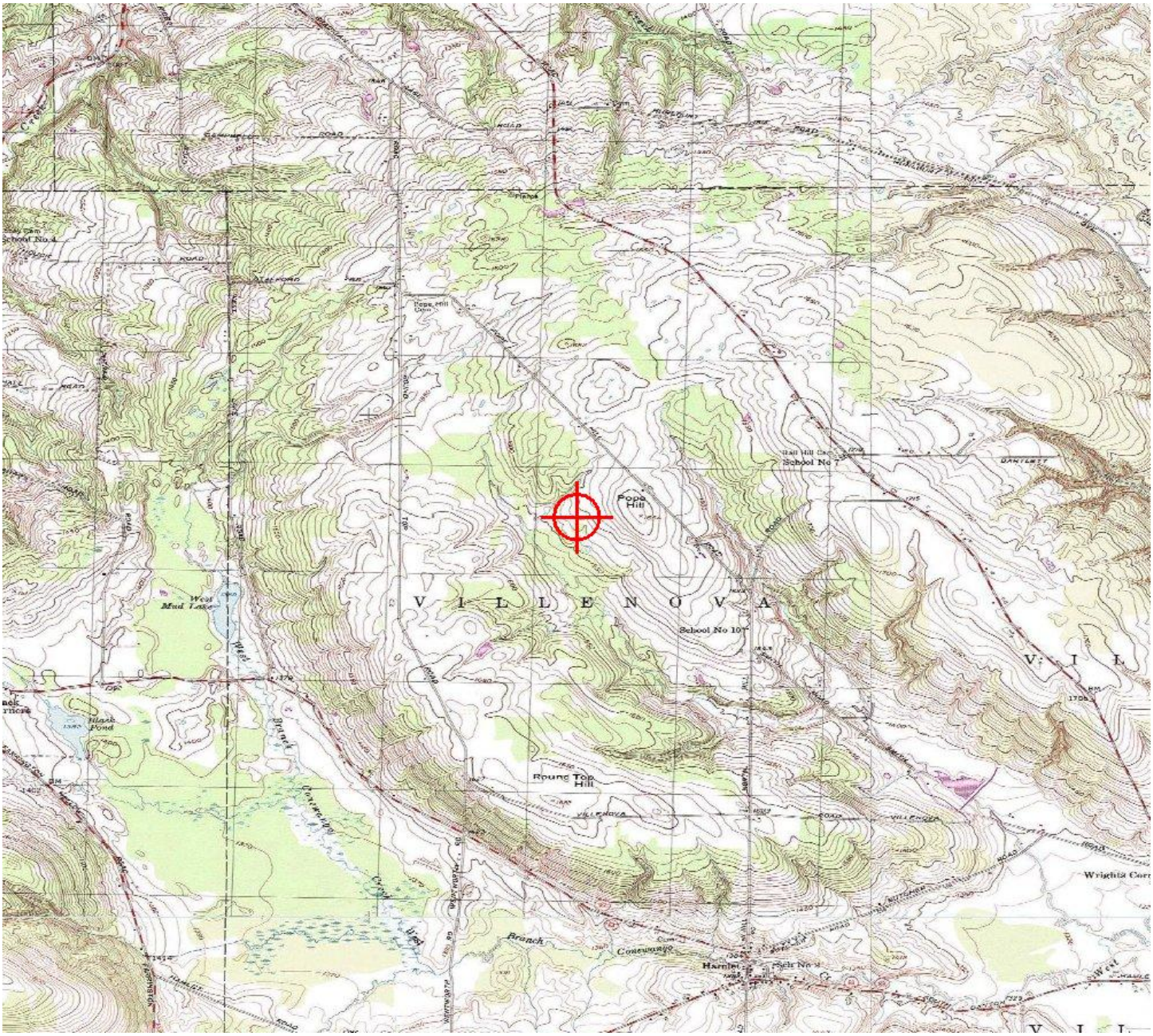
Signature Control No: 273432852-301612349 (DNE -WT)
Brenda Mumper
Specialist

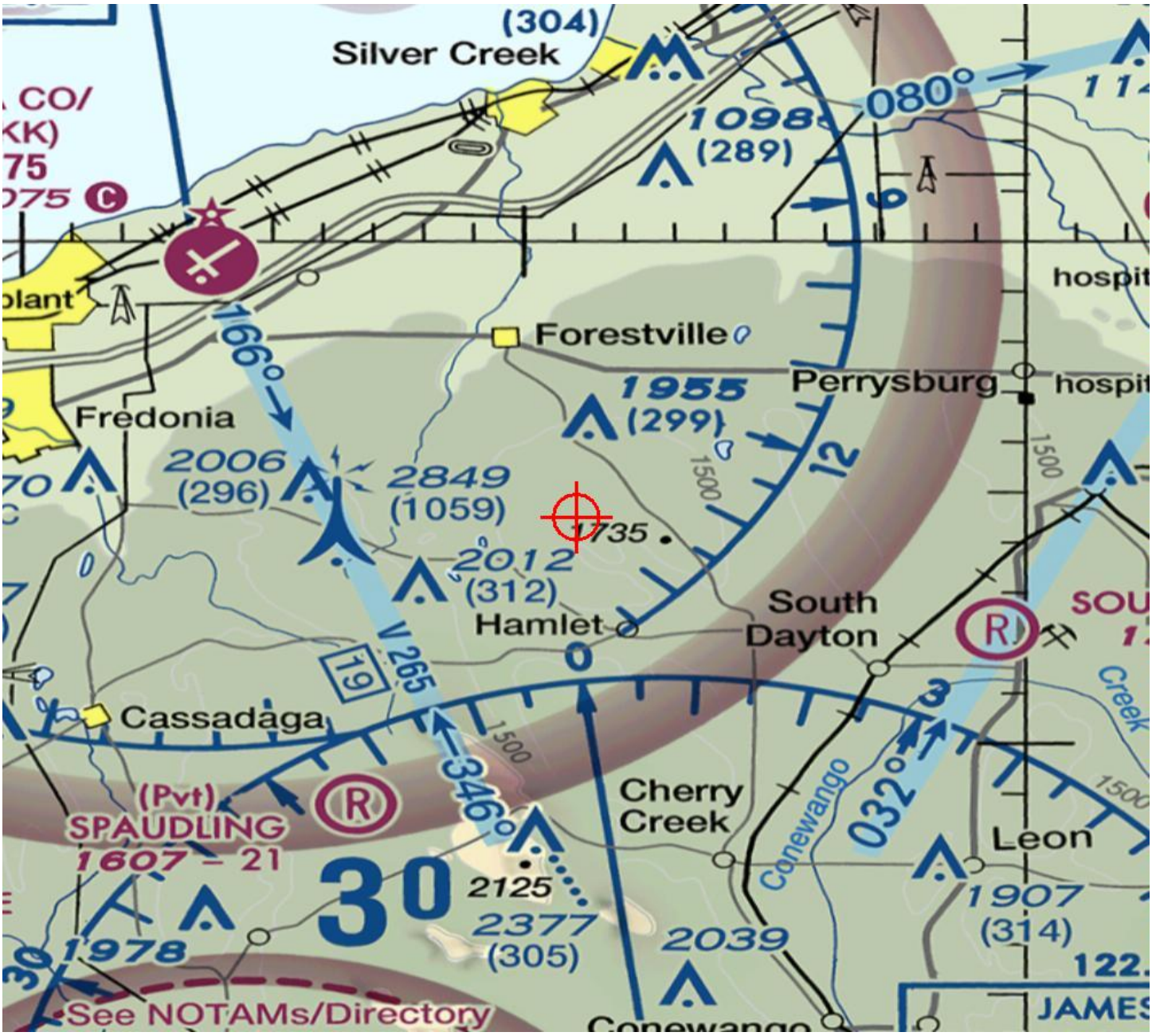
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8088-OE

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Creek
Conewango
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(314)
Leon
See NOTAMs/Directory
1500

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8089-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T12
Location:	Hamlet, NY
Latitude:	42-23-42.01N NAD 83
Longitude:	79-06-58.79W
Heights:	1620 feet site elevation (SE)
	499 feet above ground level (AGL)
	2119 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2119 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

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If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8089-OE.

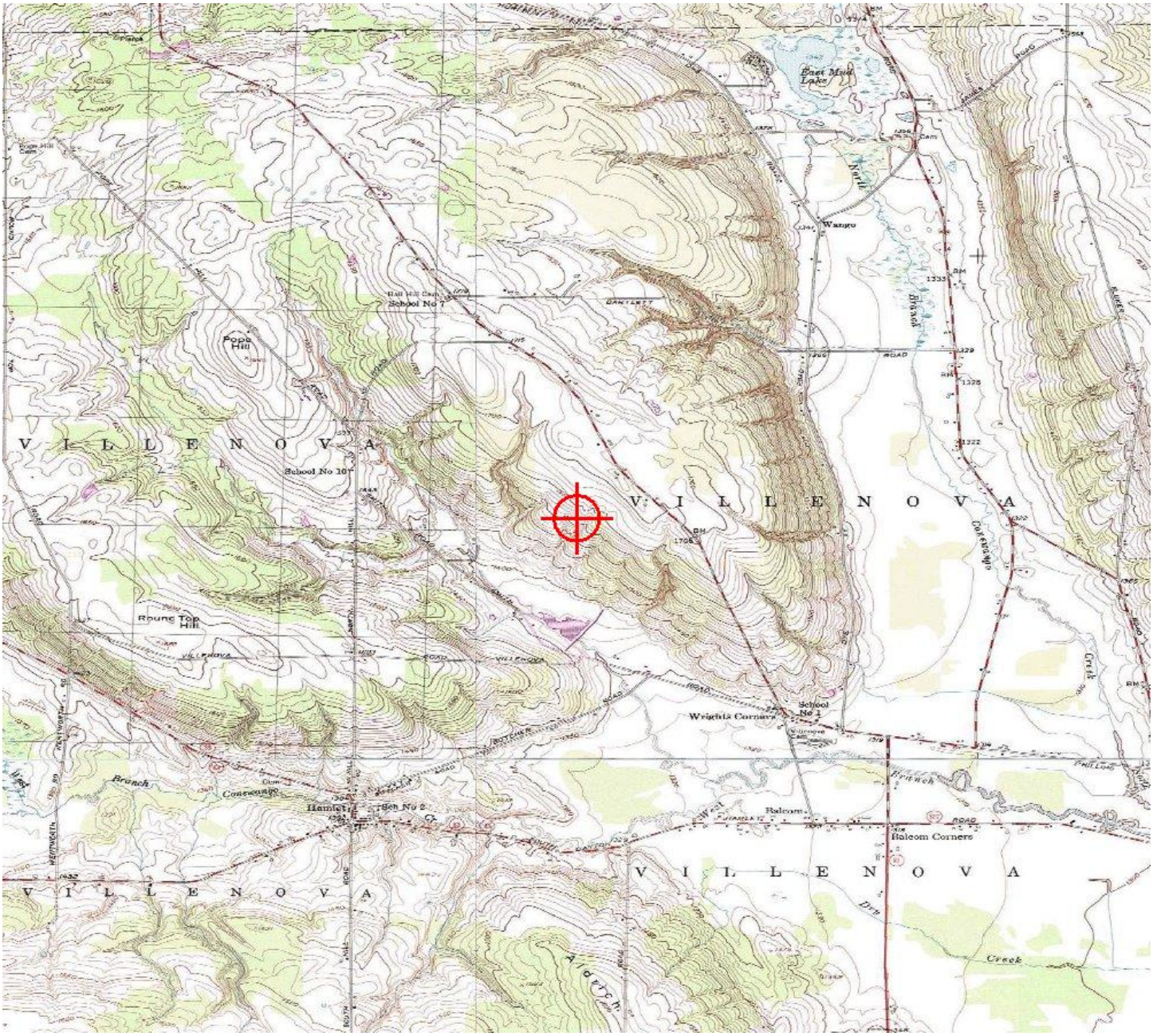
Signature Control No: 273432853-301612345 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8089-OE



Silver Creek
1098
(289)
080°
1141
hospital
Forestville
166°
1955
(299)
Perrysburg
hospital
redonia
2006
(296)
2849
(1059)
1735
2012
(312)
Hamlet
South
Dayton
SOUTH DA
1300
V 265
19
Cassadaga
346°
Cherry
Creek
Conewango
032°
Leon
1907
(314)
122.1R
JAMESTOW
114.7 Ch 94 JHW
(Pvt)
AUDLING
607 – 21
30
2125
2377
(305)
2039
978
ee NOTAMs/Directory
r Class E (sfc) eff hrs
Conewango
Valley

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8090-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T13
Location:	Hamlet, NY
Latitude:	42-23-52.64N NAD 83
Longitude:	79-07-11.91W
Heights:	1643 feet site elevation (SE)
	499 feet above ground level (AGL)
	2142 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2142 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8090-OE.

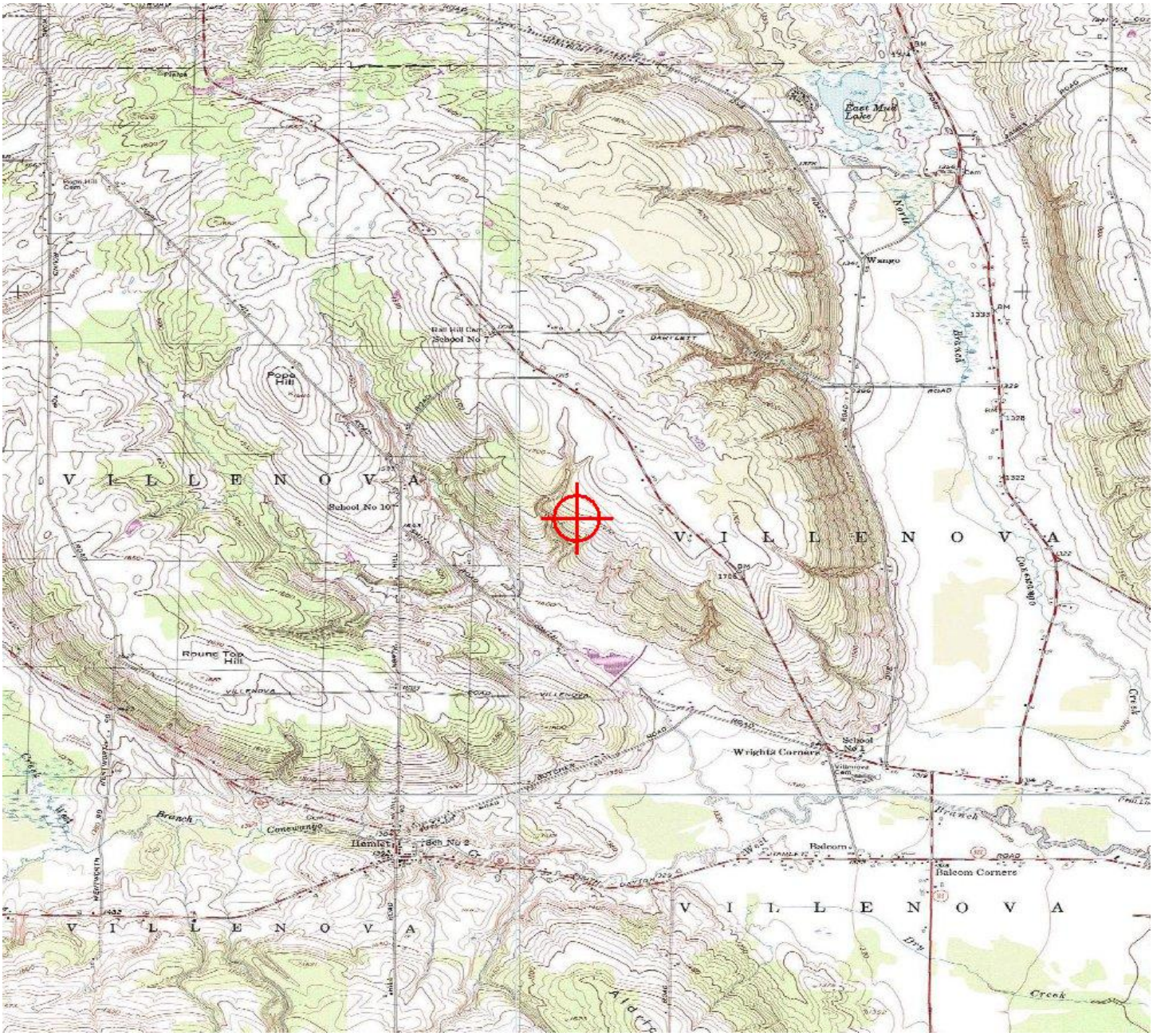
Signature Control No: 273432855-301612354 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8090-OE



Sectional Map for ASN 2015-WTE-8090-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8091-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T14
Location:	Hamlet, NY
Latitude:	42-24-13.49N NAD 83
Longitude:	79-07-19.91W
Heights:	1705 feet site elevation (SE)
	499 feet above ground level (AGL)
	2204 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2204 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8091-OE.

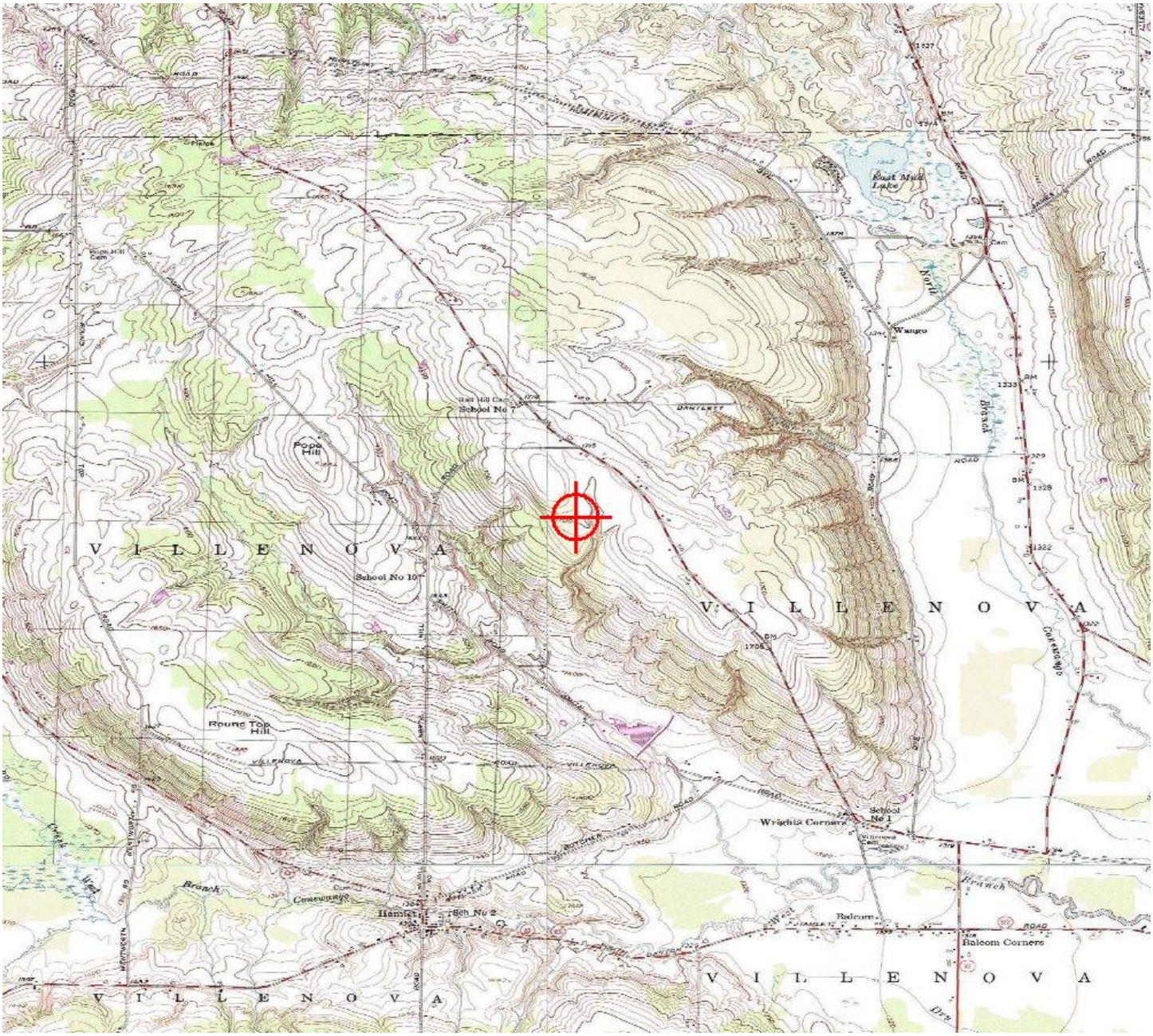
Signature Control No: 273432856-301612338 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

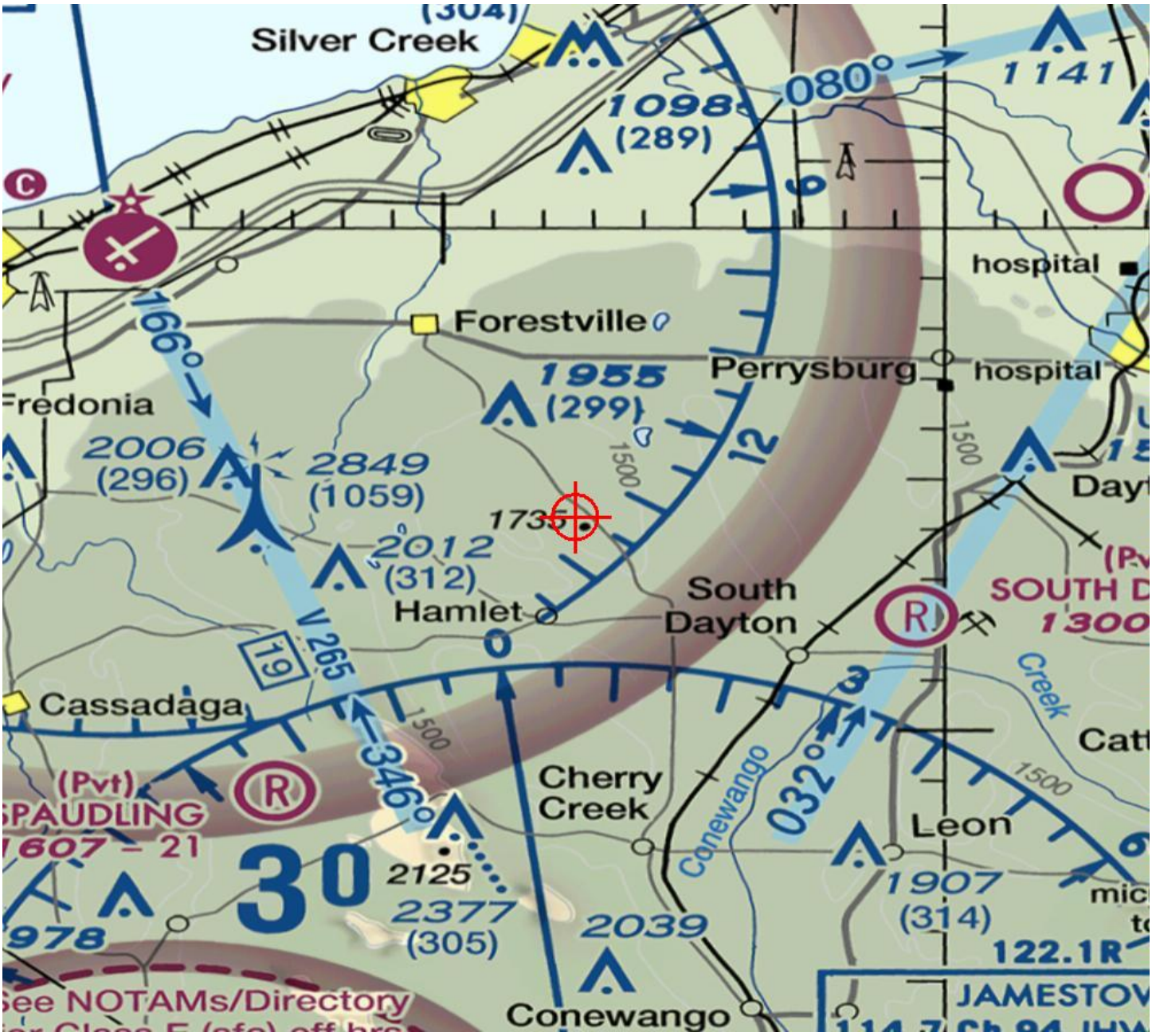
The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8091-OE



Sectional Map for ASN 2015-WTE-8091-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8092-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T15
Location:	Hamlet, NY
Latitude:	42-24-23.23N NAD 83
Longitude:	79-07-35.11W
Heights:	1700 feet site elevation (SE)
	499 feet above ground level (AGL)
	2199 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2199 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

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This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8092-OE.

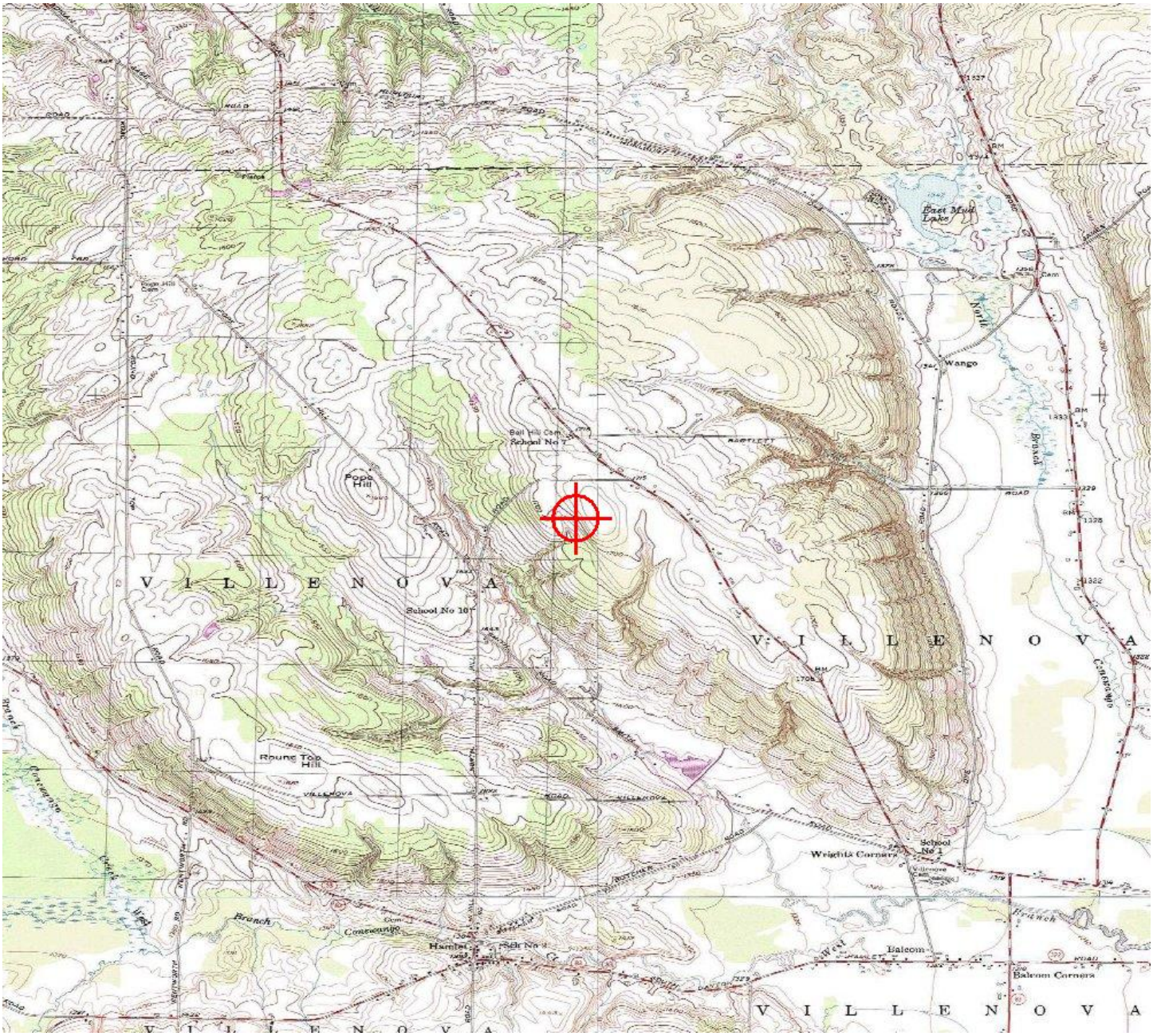
Signature Control No: 273432857-301612353 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8092-OE



Sectional Map for ASN 2015-WTE-8092-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8093-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T16
Location:	Hamlet, NY
Latitude:	42-24-46.73N NAD 83
Longitude:	79-08-07.68W
Heights:	1640 feet site elevation (SE)
	499 feet above ground level (AGL)
	2139 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2139 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8093-OE.

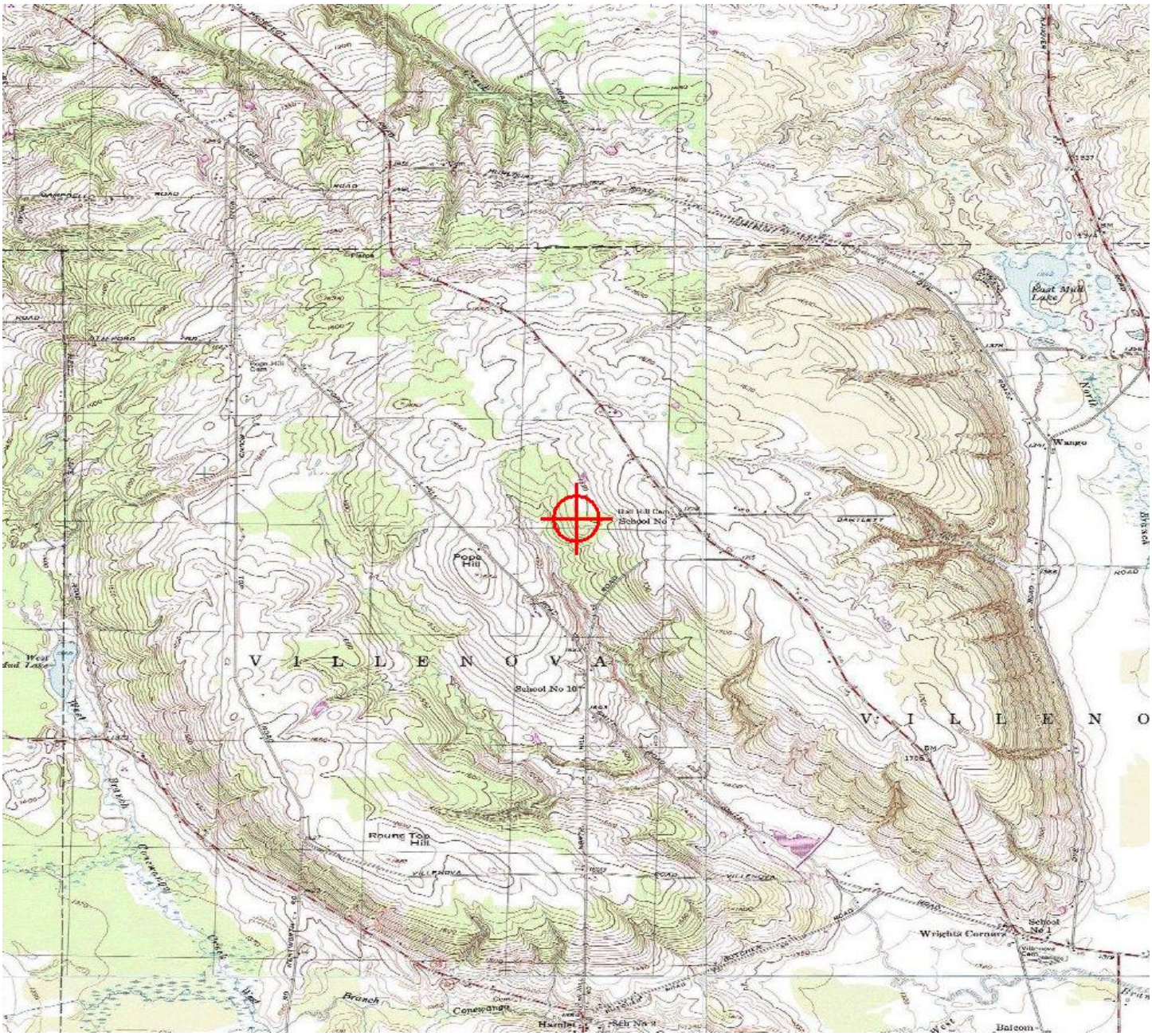
Signature Control No: 273432858-301612347 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8093-OE



Sectional Map for ASN 2015-WTE-8093-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8094-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T17
Location:	Hamlet, NY
Latitude:	42-25-00.39N NAD 83
Longitude:	79-08-21.83W
Heights:	1632 feet site elevation (SE)
	499 feet above ground level (AGL)
	2131 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2131 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8094-OE.

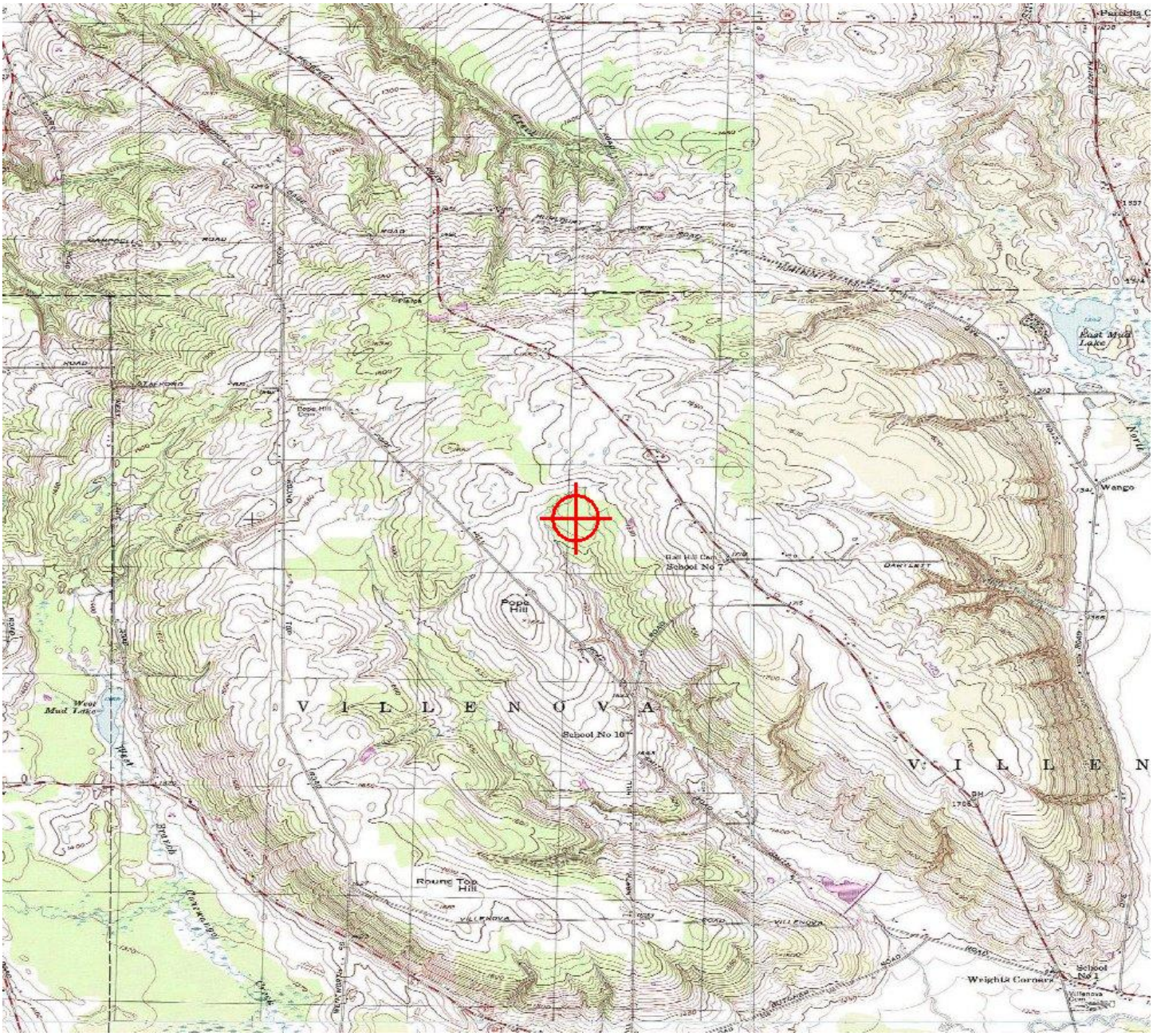
Signature Control No: 273432860-301612357 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8094-OE



Sectional Map for ASN 2015-WTE-8094-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8095-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T18
Location:	Hamlet, NY
Latitude:	42-25-19.11N NAD 83
Longitude:	79-08-28.15W
Heights:	1660 feet site elevation (SE)
	499 feet above ground level (AGL)
	2159 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

Any height exceeding 499 feet above ground level (2159 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before September 10, 2016. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager, Airspace Policy & Regulation, Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on September 20, 2016 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Brenda Mumper, at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8095-OE.

Signature Control No: 273432861-301594060 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

The proposed structures noted in this letter are part of a proposed wind farm that would be located near Hamlet, New York. They would be located from 6.35 to 7.21 nautical miles (NM) southeast of the airport reference point for the Chautauqua County/Dunkirk Airport (DKK) in Dunkirk, New York. The determinations for each of the structures will be available upon issuance on the website, http://oeaaa.faa.gov.

Following are the Aeronautical Study Numbers, coordinates, site elevation, above ground level and above mean sea level heights for each of the proposals:

2015-WTE-8095-OE 42-25-19.11N / 79-08-28.15W 1660 / 499 / 2159
2015-WTE-8117-OE 42-25-28.86N / 79-08-55.62W 1640 / 499 / 2139
2015-WTE-8118-OE 42-25-51.55N / 79-09-21.52W 1605 / 499 / 2104
2015-WTE-8119-OE 42-25-45.90N / 79-09-02.69W 1622 / 499 / 2121

OBSTRUCTION STANDARD(S) EXCEEDED

Section 77.17(a)(3): A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

The proposals would exceed this obstruction standard as noted as applied to DKK:

2015-WTE-8095-OE
Obstacle penetrates Runway 15 Diverse A departure area 14 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8117-OE
Obstacle penetrates Runway 15 Diverse A departure area 46 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8118-OE
Obstacle penetrates Runway 15 Diverse A departure area 87 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8119-OE
Obstacle penetrates Runway 15 Diverse A departure area 71 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

The proposal was circularized on July 29, 2016, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. No comments were received as a result of the circularization.

Aeronautical study disclosed that the structure would have no significant effect on any existing or proposed arrival, departure, or en route instrument flight rule (IFR) operations or procedures. Further study did not

indicate that the IFR impacts noted above would affect a significant number of aircraft operations; therefore, those impacts would not create substantial adverse effect.

Study for possible visual flight rules (VFR) effect disclosed that the proposal would have no effect on any existing or proposed arrival or departure VFR operations or procedures. It would not conflict with airspace required to conduct normal VFR traffic pattern operations at DKK or any other known public-use or military airports. At 499 ft. AGL, the proposed structure would not have a substantial adverse effect on VFR en route flight operations.

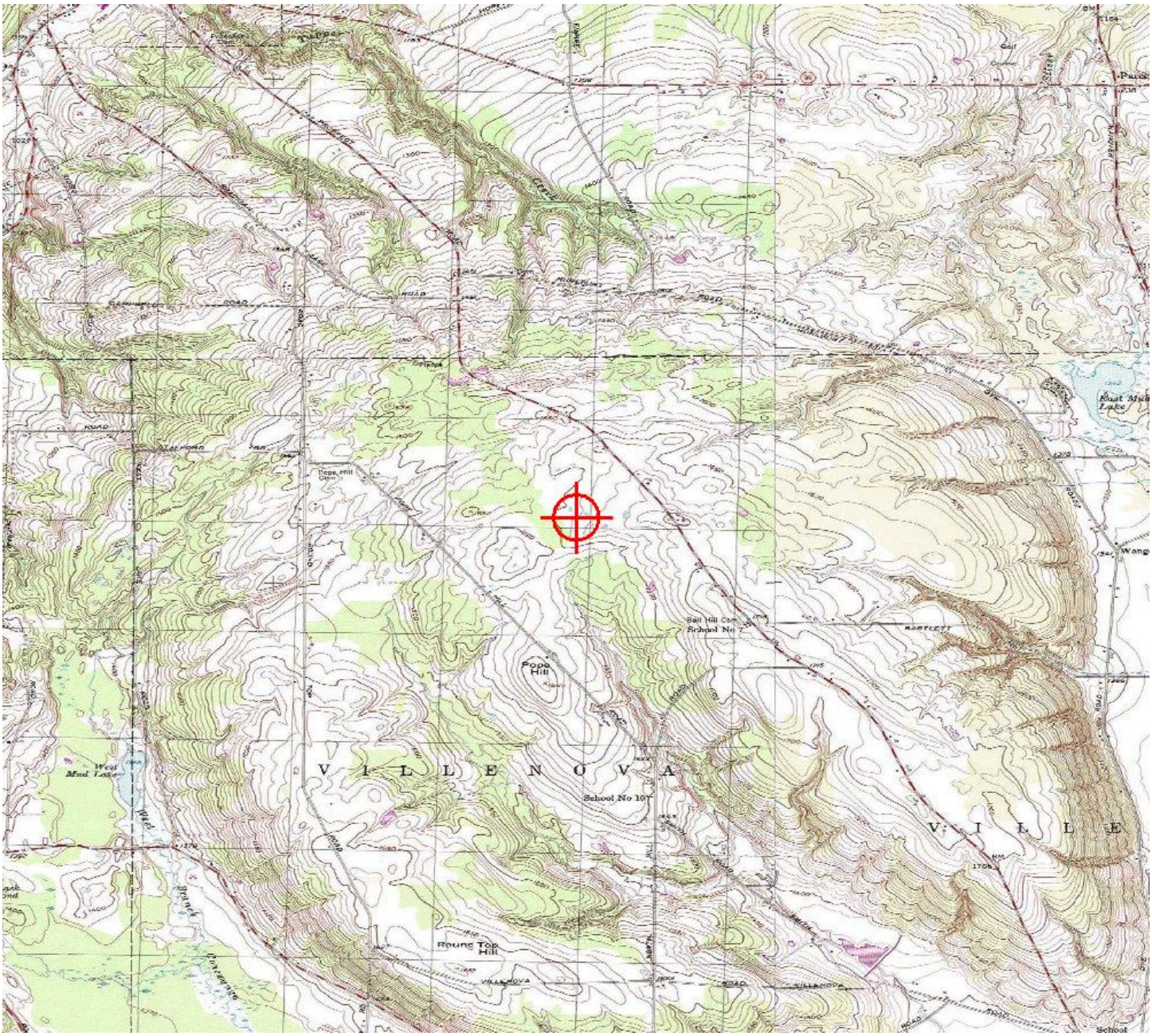
The cumulative impact of the structure, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposal affect the capacity of any known existing or planned public-use or military airport. The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

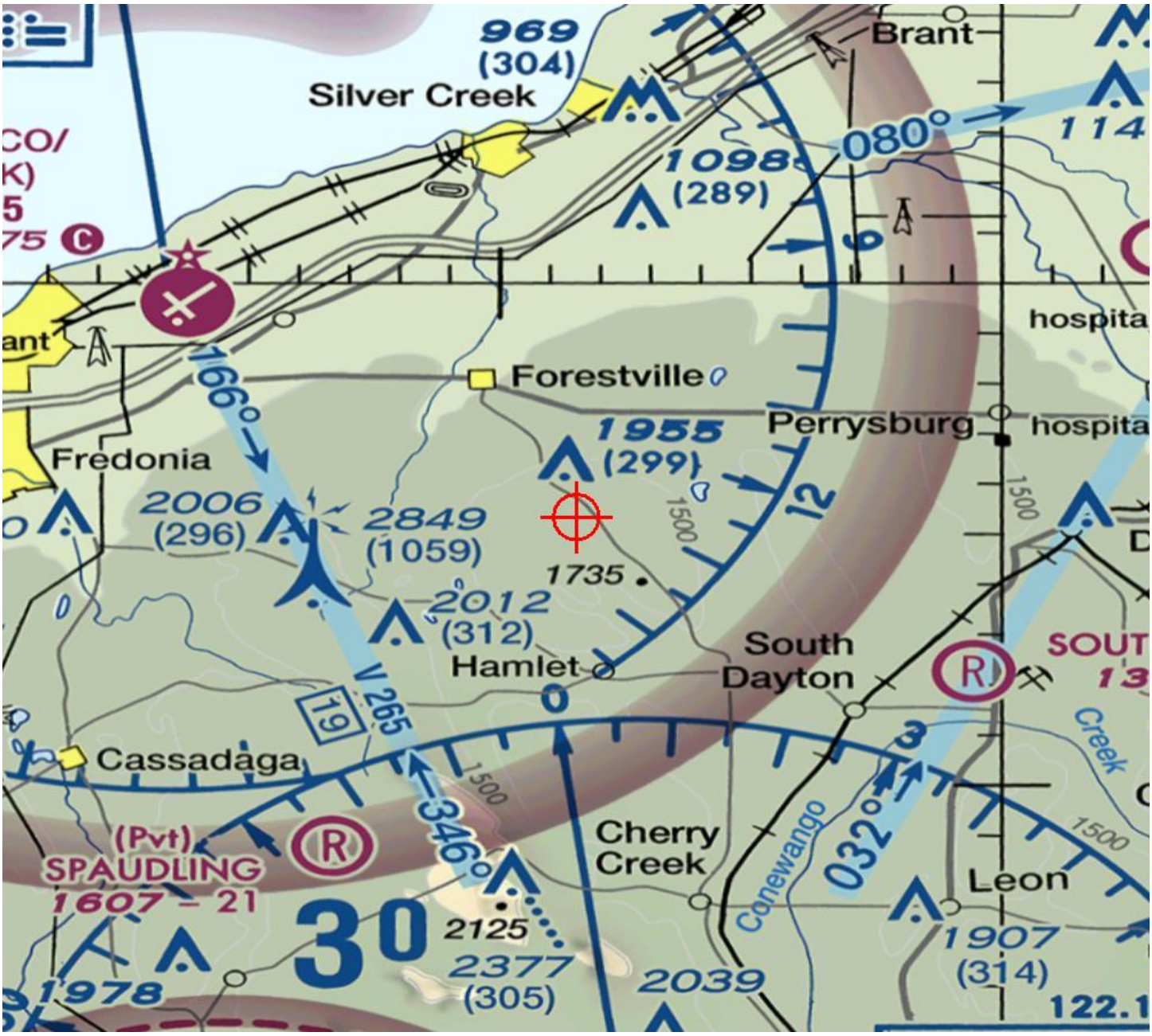
Therefore, it is determined that the proposed structure would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

All determinations will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

NOTE: IT IS IMPERATIVE THAT PART 1 OF THE 7460-2 FORM IS SUBMITTED AT LEAST 10 DAYS PRIOR TO BEGINNING CONSTRUCTION SO IFR ALTITUDES MAY BE AMENDED AS REQUIRED.

TOPO Map for ASN 2015-WTE-8095-OE

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Mail Processing Center
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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8096-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T19
Location:	Hamlet, NY
Latitude:	42-23-55.14N NAD 83
Longitude:	79-06-18.89W
Heights:	1703 feet site elevation (SE)
	499 feet above ground level (AGL)
	2202 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2202 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8096-OE.

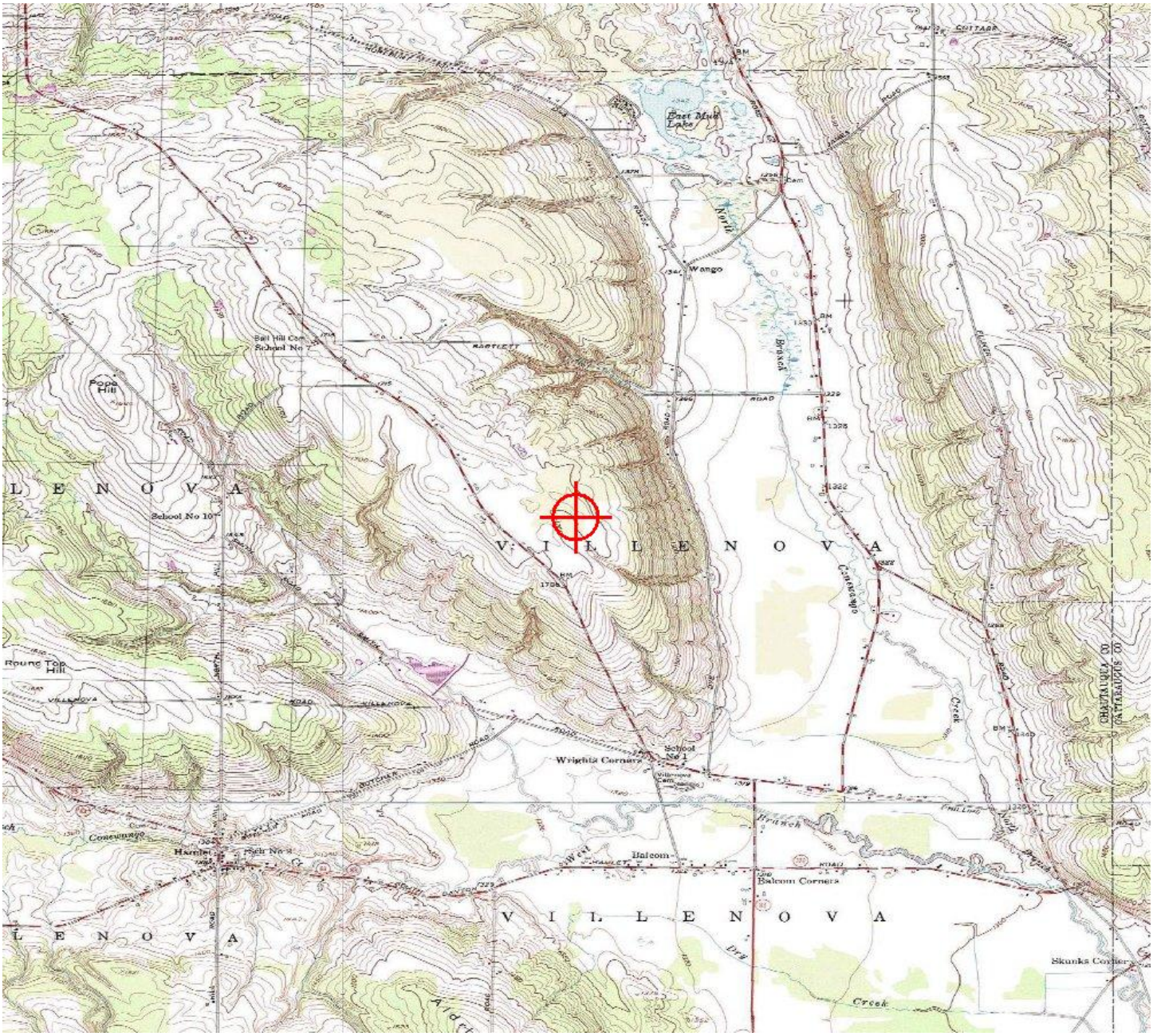
Signature Control No: 273432862-301612346 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8096-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8097-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T20
Location:	Hamlet, NY
Latitude:	42-24-04.09N NAD 83
Longitude:	79-06-27.97W
Heights:	1708 feet site elevation (SE)
	499 feet above ground level (AGL)
	2207 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2207 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8097-OE.

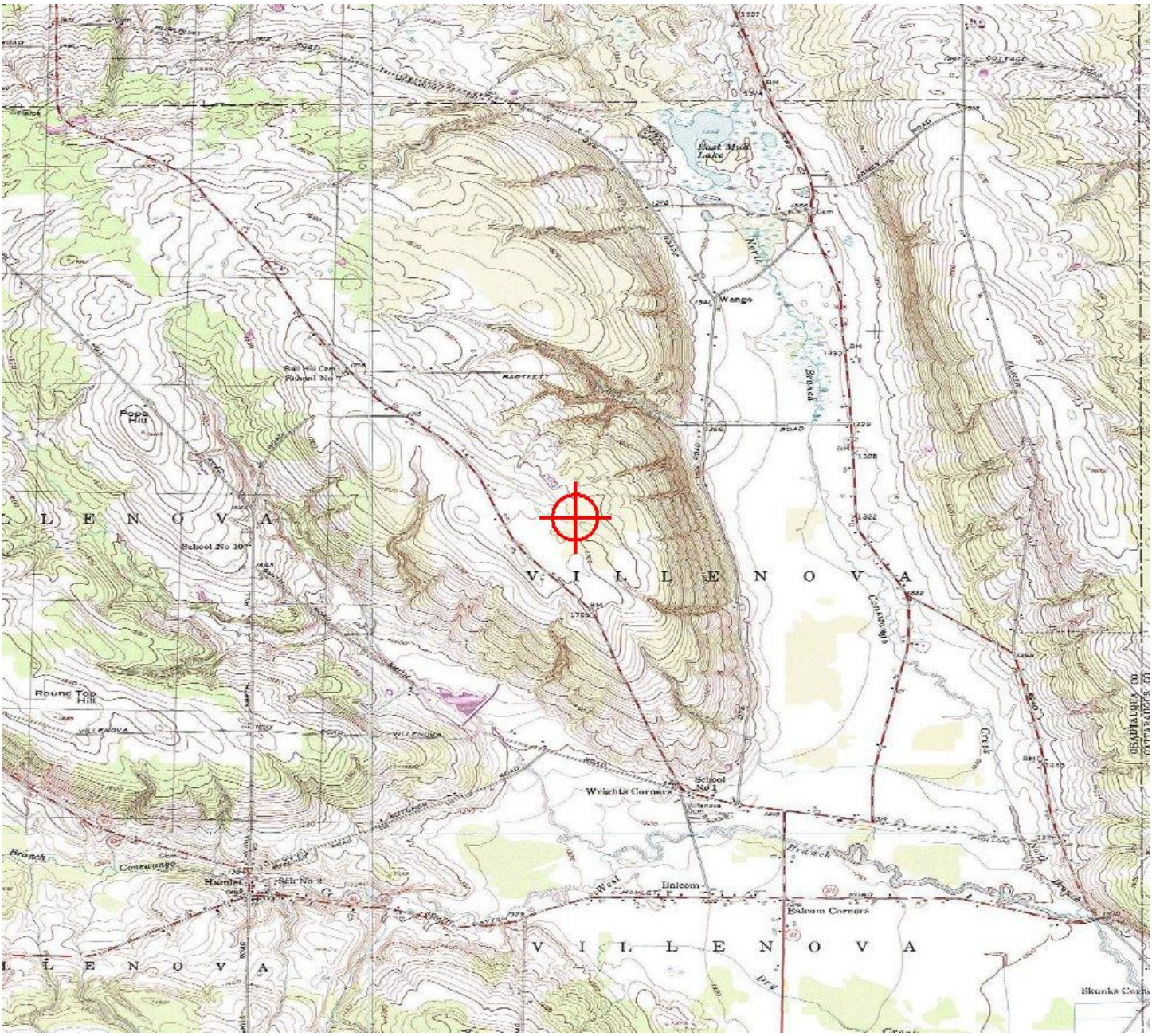
Signature Control No: 273432863-301612356 (DNE -WT)
Brenda Mumper
Specialist

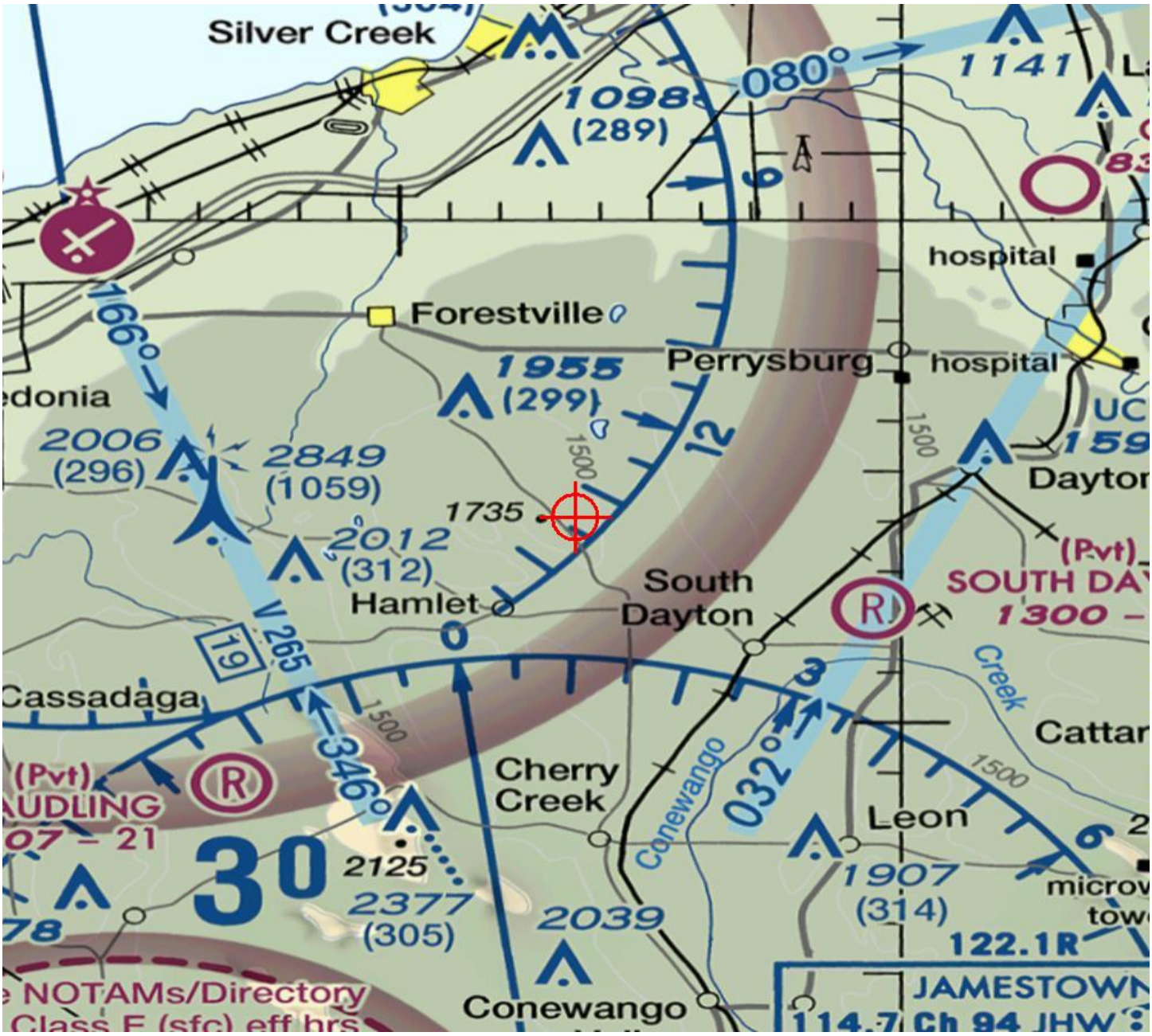
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8097-OE




Silver Creek
1098
(289)
080°
1141
hospital
Forestville
166°
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1955
(299)
2006
(296)
2849
(1059)
1735
2012
(312)
Hamlet
South
Dayton
(Pvt)
SOUTH DA
1300 –
V 265
19
Cassadaga
346°
Cherry
Creek
Conewango
032°
Creek
Cattar
(Pvt)
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(305)
2039
Leon
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78
NOTAMs/Directory
Class E (sfc) eff hrs
Conewango
JAMESTOWN
Ch 94 JHW

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8098-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T21
Location:	Hamlet, NY
Latitude:	42-23-45.81N NAD 83
Longitude:	79-06-01.68W
Heights:	1670 feet site elevation (SE)
	499 feet above ground level (AGL)
	2169 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2169 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8098-OE.

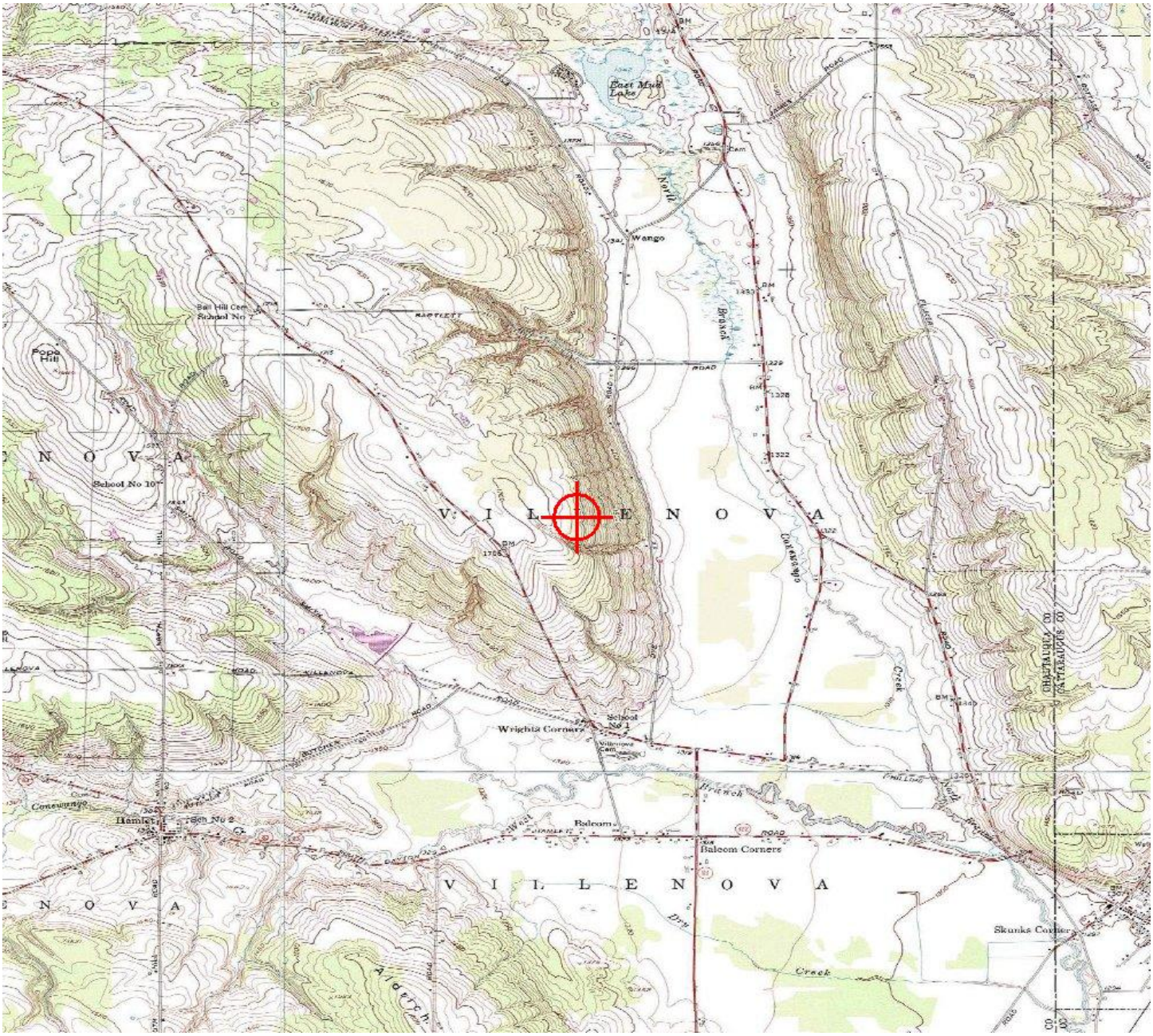
Signature Control No: 273432866-301612343 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

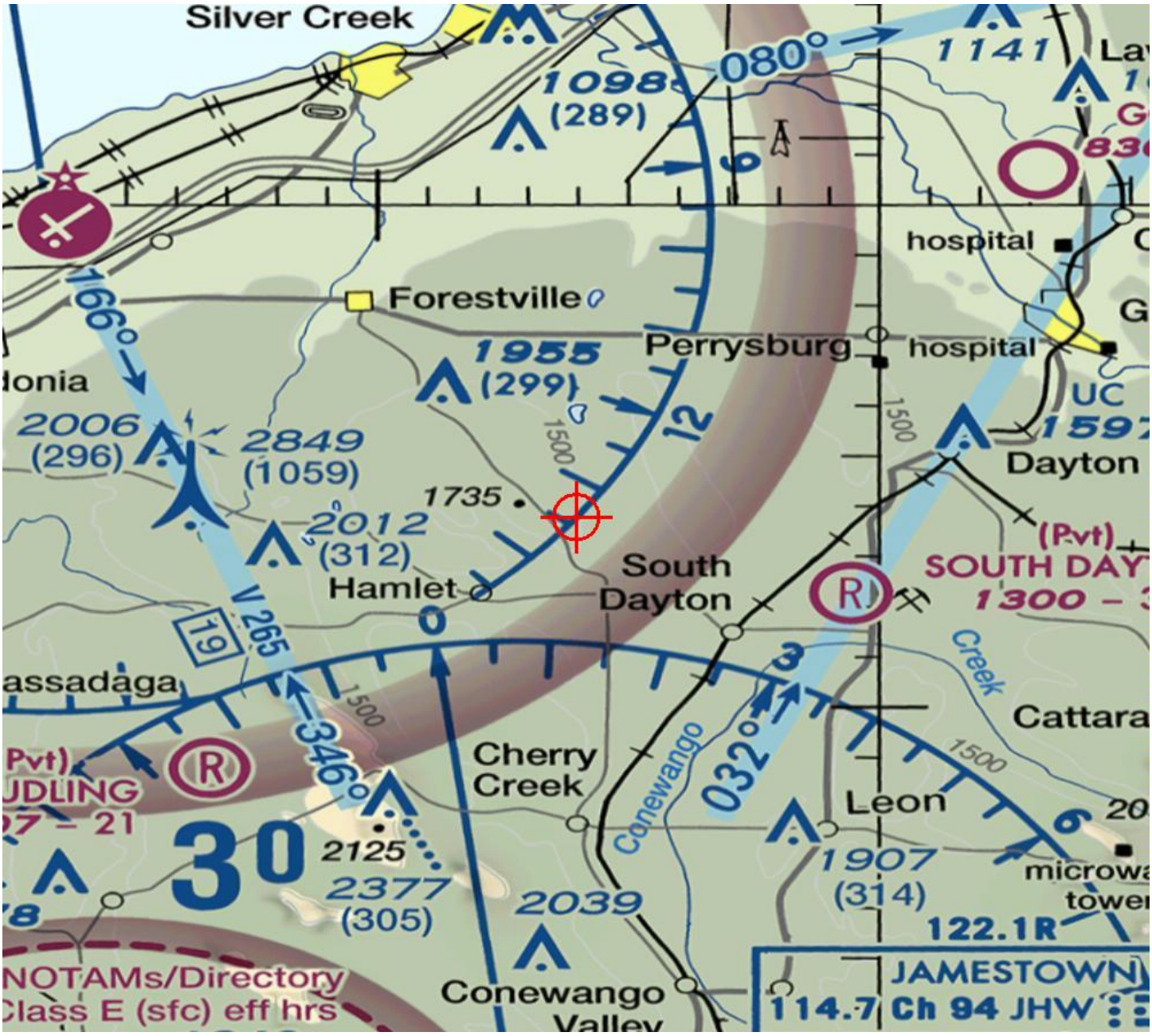
The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8098-OE



Sectional Map for ASN 2015-WTE-8098-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8099-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T23
Location:	Hamlet, NY
Latitude:	42-24-33.78N NAD 83
Longitude:	79-06-40.44W
Heights:	1648 feet site elevation (SE)
	499 feet above ground level (AGL)
	2147 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2147 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8099-OE.

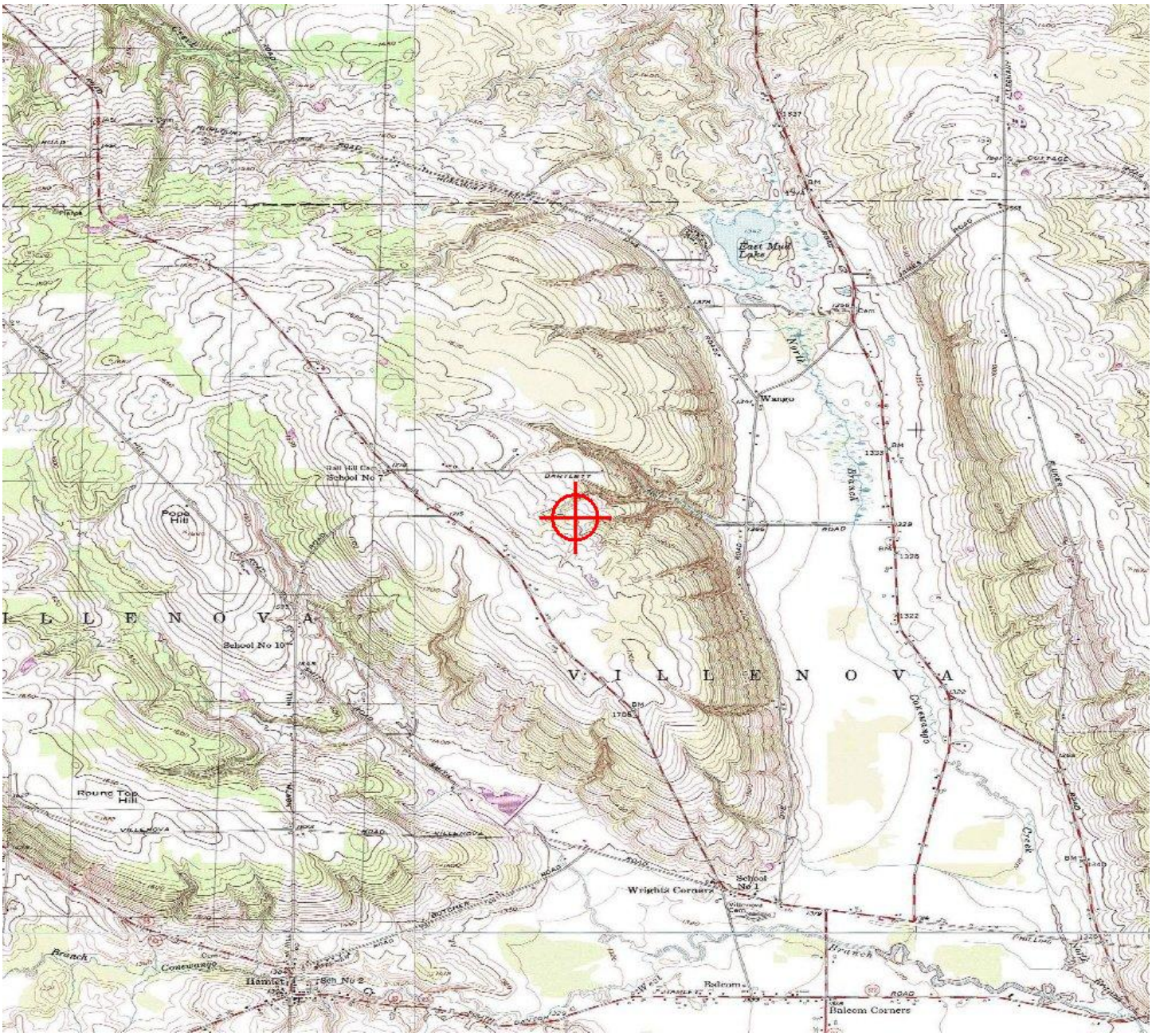
Signature Control No: 273432867-301612341 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8099-OE



Sectional Map for ASN 2015-WTE-8099-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8100-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T25
Location:	Hamlet, NY
Latitude:	42-25-20.72N NAD 83
Longitude:	79-06-36.20W
Heights:	1615 feet site elevation (SE)
	499 feet above ground level (AGL)
	2114 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2114 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

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If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8100-OE.

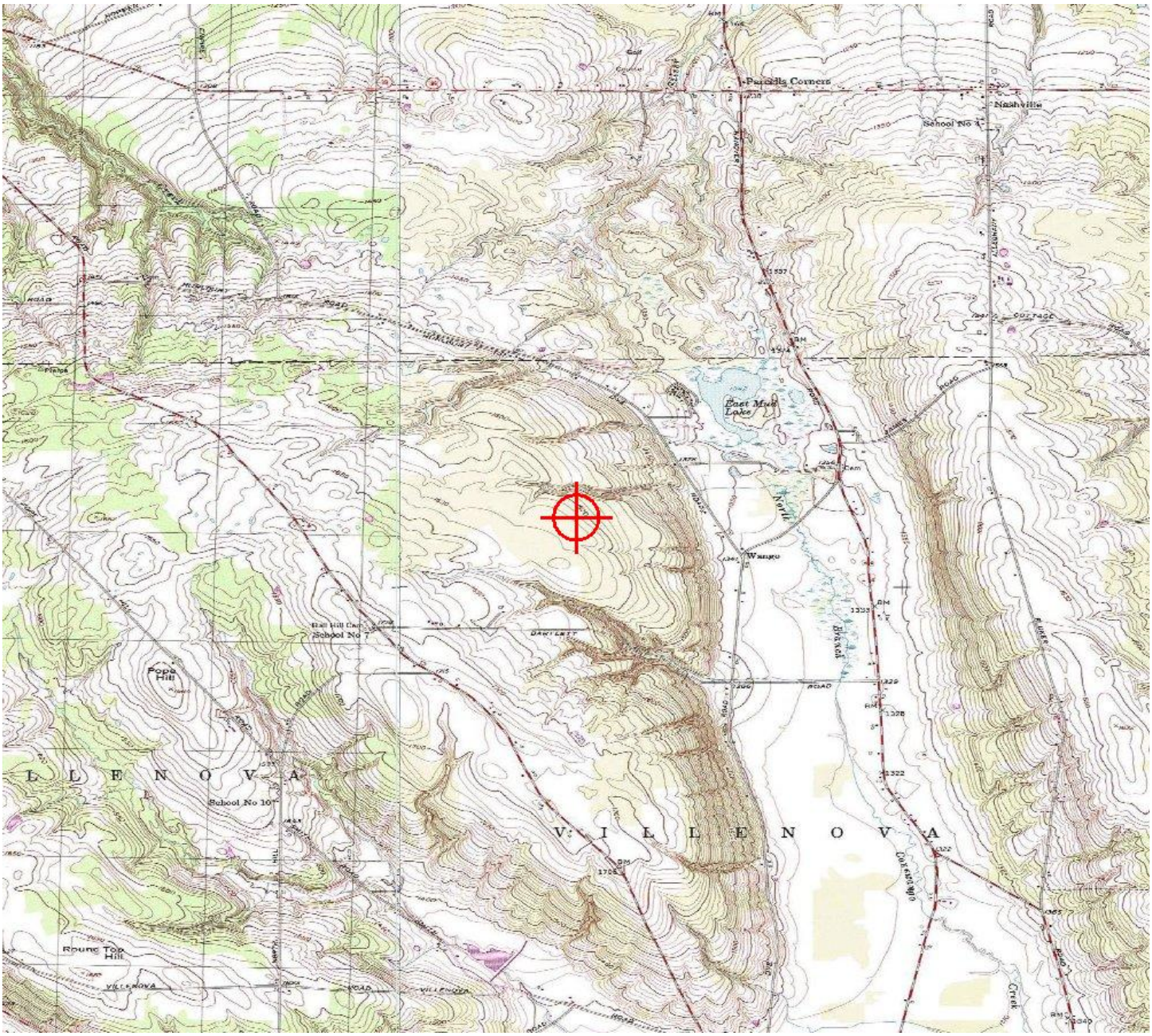
Signature Control No: 273432868-301612362 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

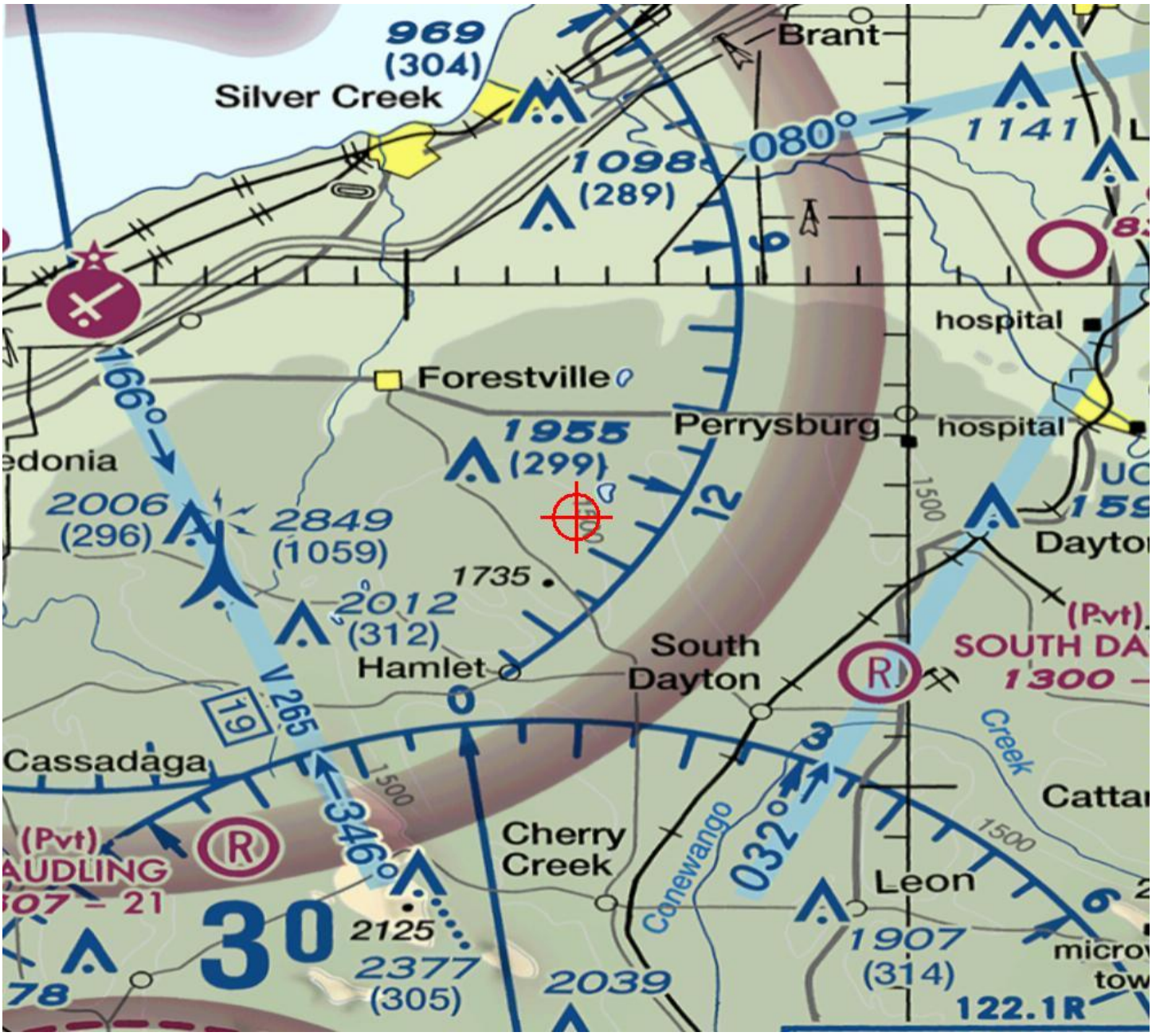
The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8100-OE



Sectional Map for ASN 2015-WTE-8100-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8101-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T26
Location:	Hamlet, NY
Latitude:	42-25-34.69N NAD 83
Longitude:	79-06-52.33W
Heights:	1622 feet site elevation (SE)
	499 feet above ground level (AGL)
	2121 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2121 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

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If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8101-OE.

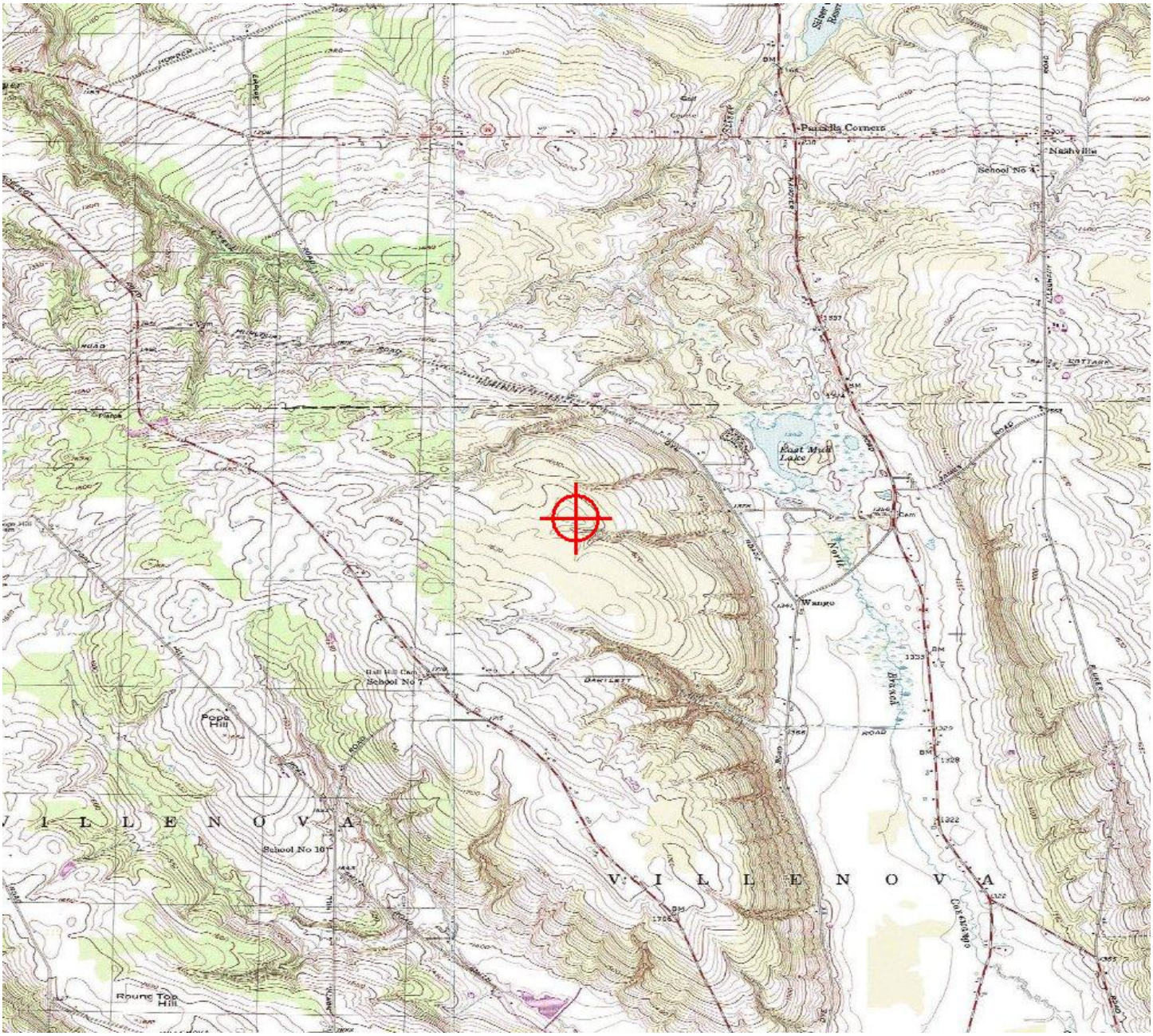
Signature Control No: 273432870-301612365 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

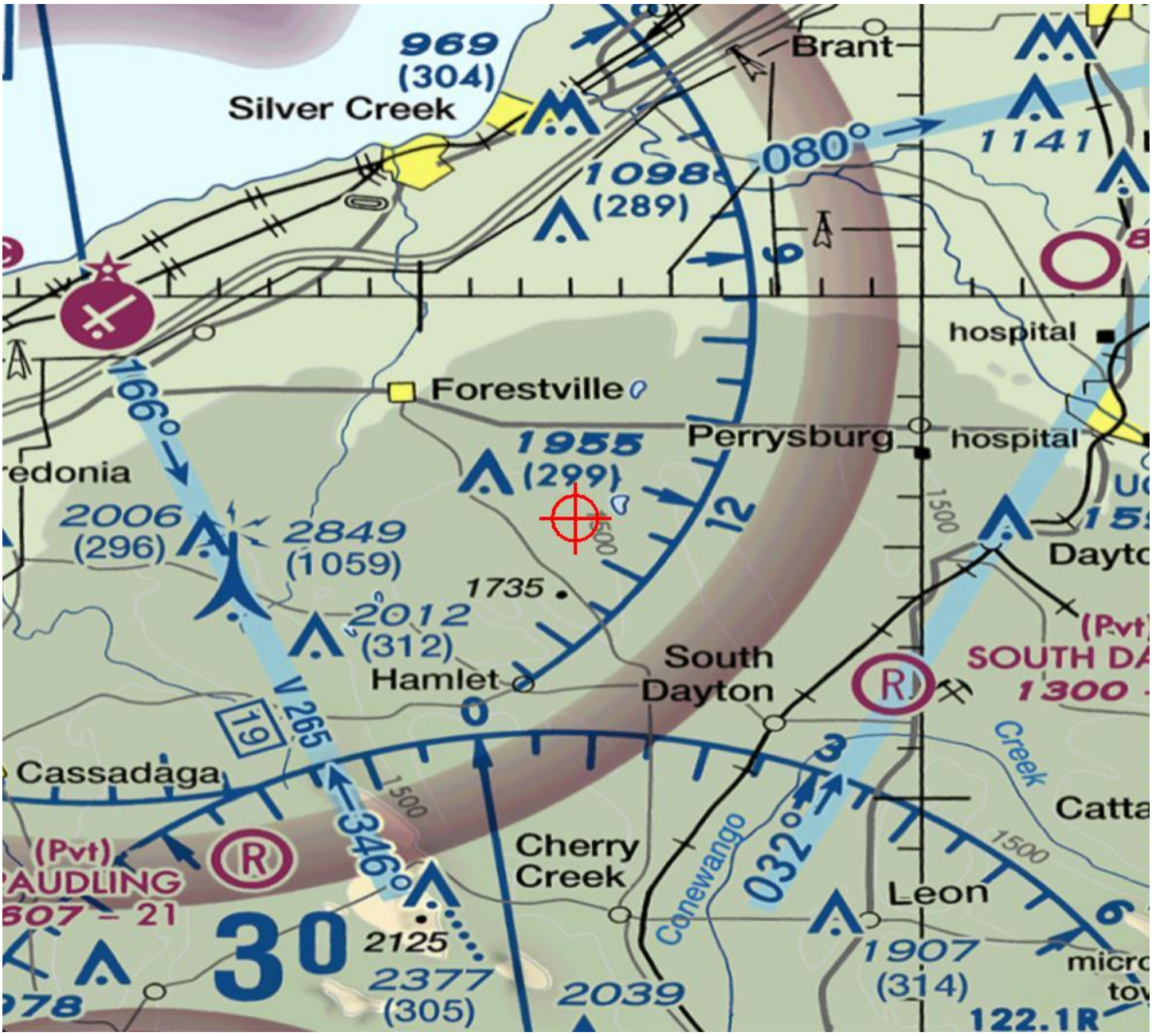
The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8101-OE



Sectional Map for ASN 2015-WTE-8101-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8102-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T27
Location:	Hamlet, NY
Latitude:	42-25-40.48N NAD 83
Longitude:	79-07-07.42W
Heights:	1605 feet site elevation (SE)
	499 feet above ground level (AGL)
	2104 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

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__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2104 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8102-OE.

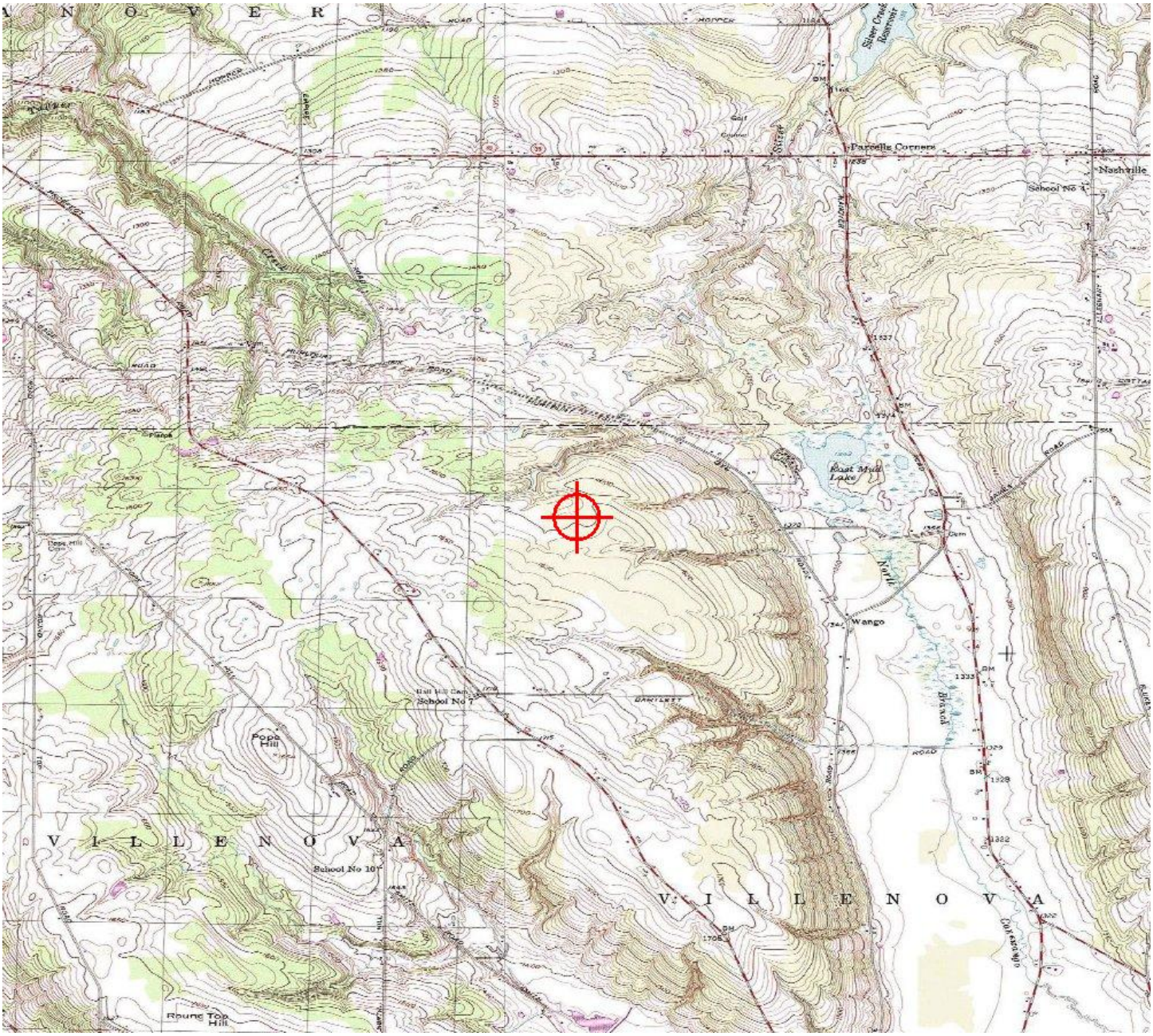
Signature Control No: 273432873-301612369 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

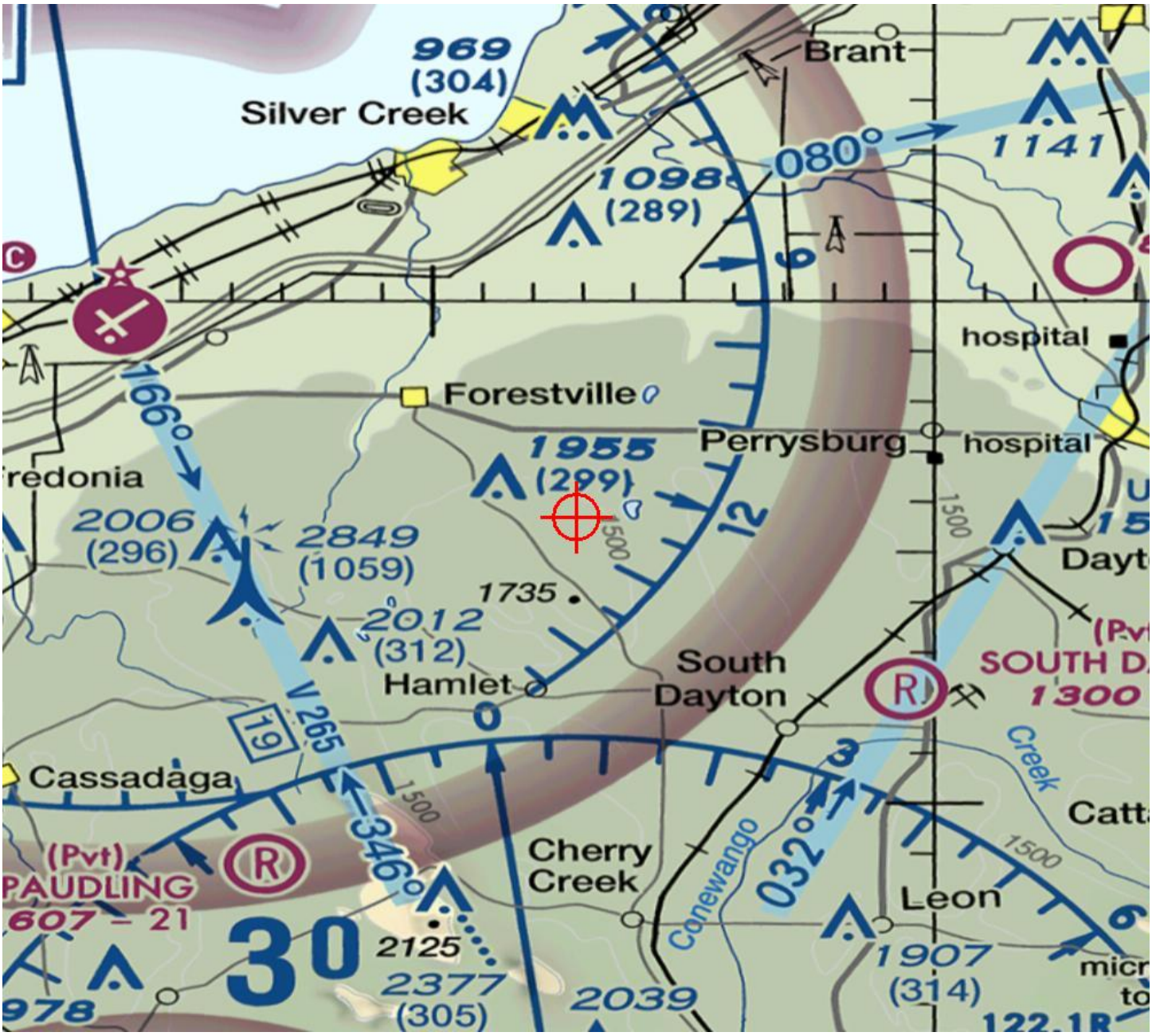
The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8102-OE



Sectional Map for ASN 2015-WTE-8102-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8103-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T28
Location:	Hamlet, NY
Latitude:	42-25-44.39N NAD 83
Longitude:	79-07-30.76W
Heights:	1600 feet site elevation (SE)
	499 feet above ground level (AGL)
	2099 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2099 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8103-OE.

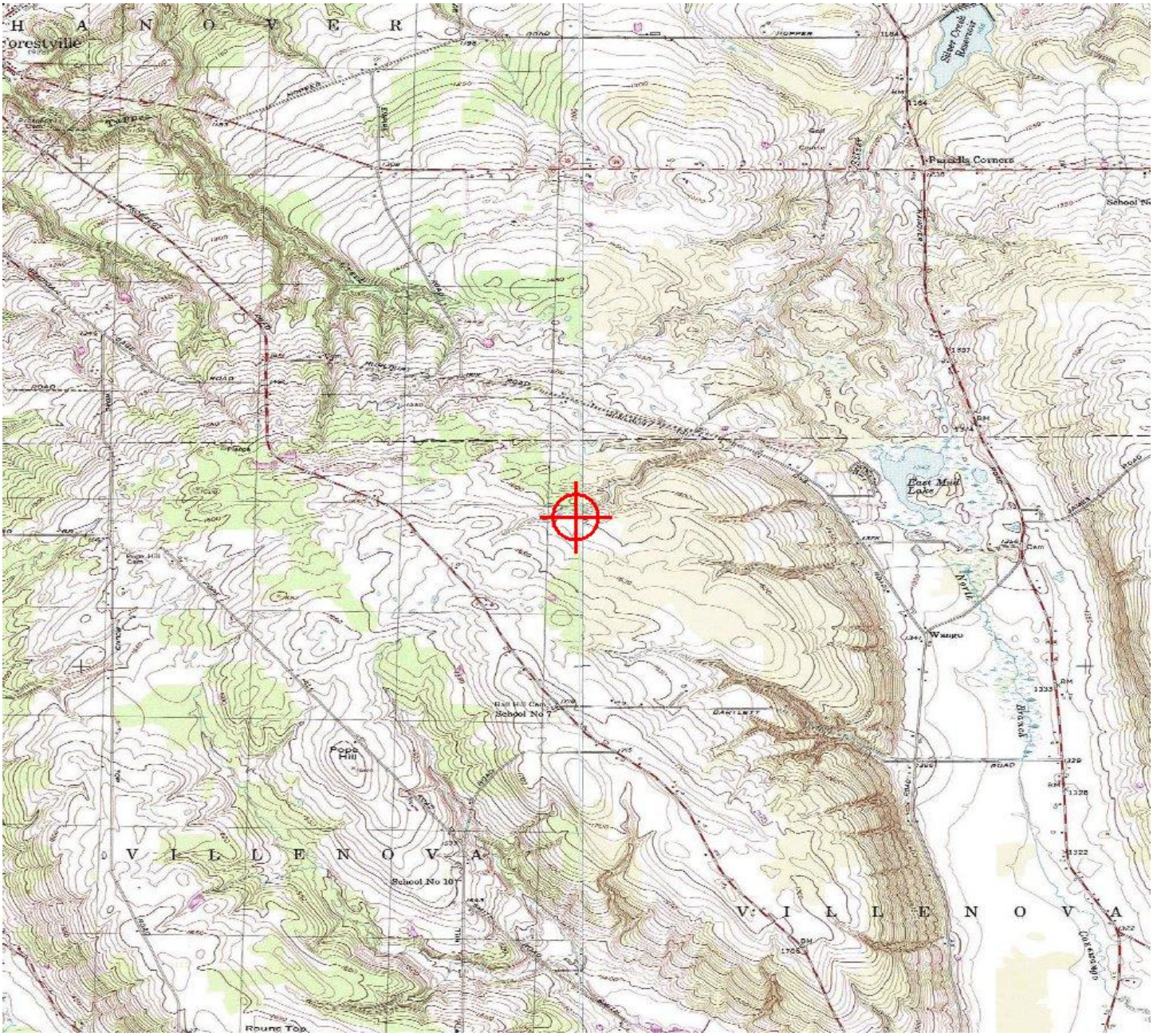
Signature Control No: 273432874-301612372 (DNE -WT)
Brenda Mumper
Specialist

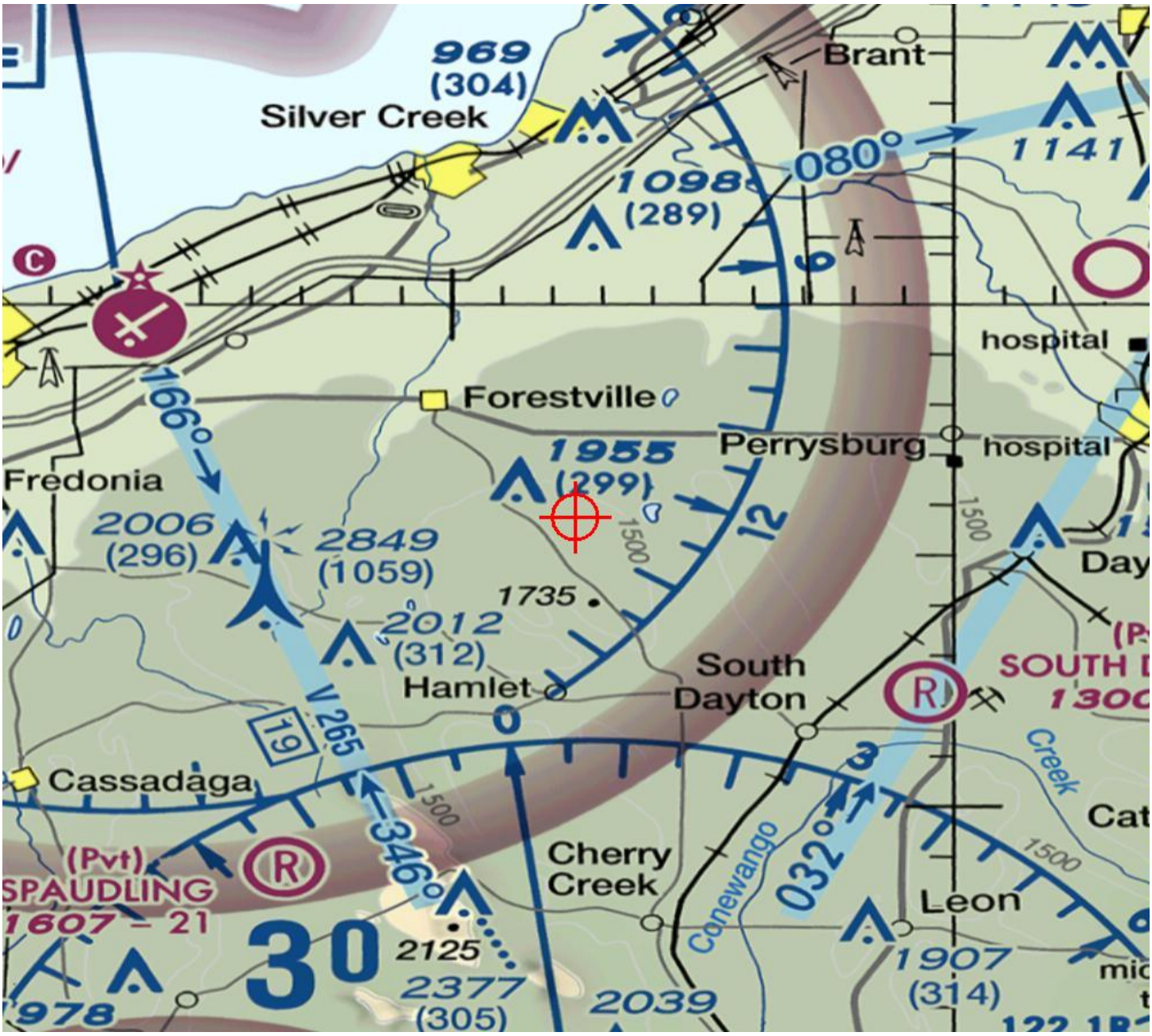
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8103-OE

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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8104-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T29
Location:	Hamlet, NY
Latitude:	42-25-52.45N NAD 83
Longitude:	79-07-42.47W
Heights:	1595 feet site elevation (SE)
	499 feet above ground level (AGL)
	2094 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2094 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8104-OE.

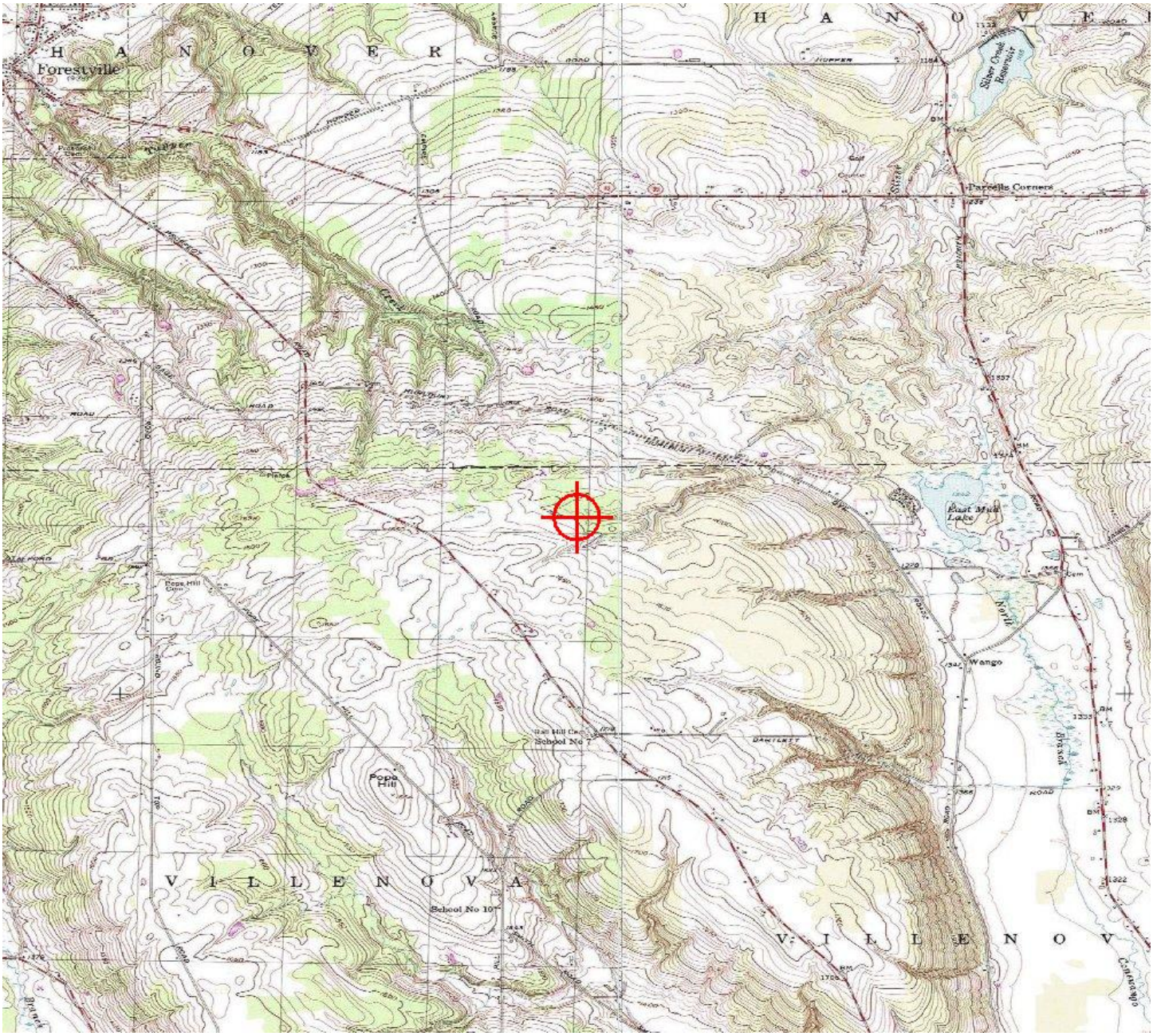
Signature Control No: 273432875-301612376 (DNE -WT)
Brenda Mumper
Specialist

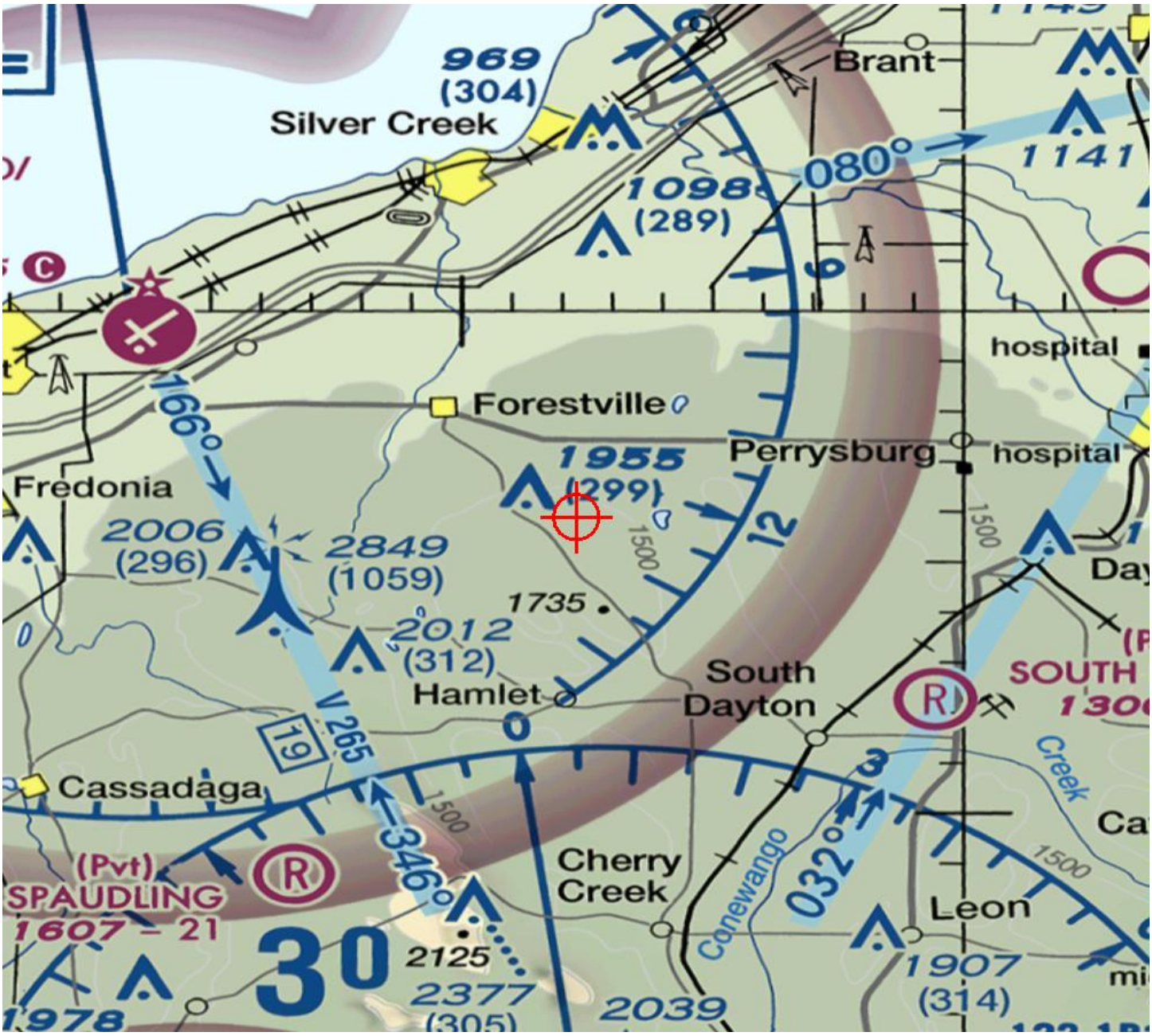
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8104-OE

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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8105-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T30
Location:	Hamlet, NY
Latitude:	42-25-59.82N NAD 83
Longitude:	79-08-00.17W
Heights:	1610 feet site elevation (SE)
	499 feet above ground level (AGL)
	2109 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2109 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

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This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8105-OE.

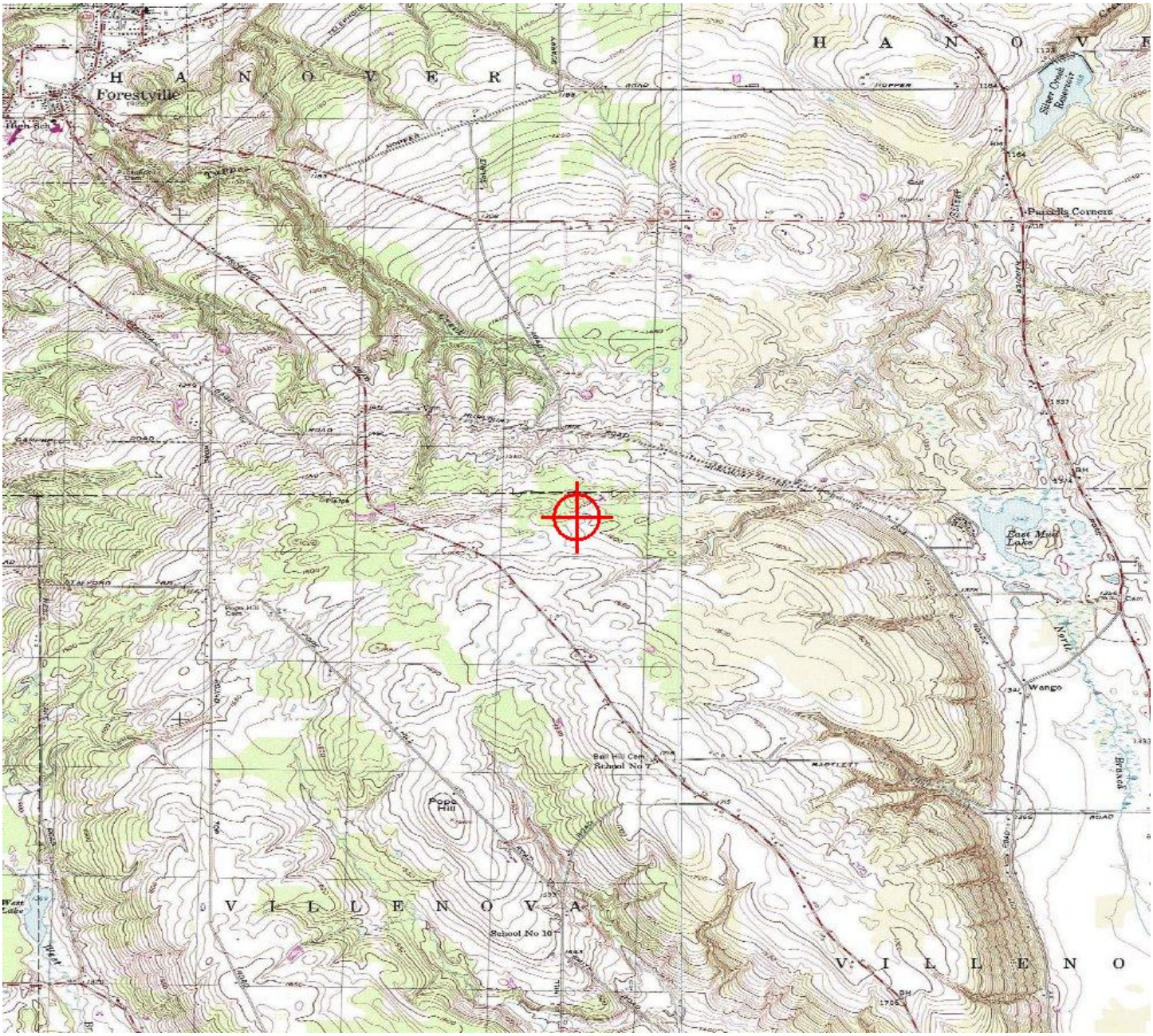
Signature Control No: 273432877-301612379 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8105-OE



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Mail Processing Center
Federal Aviation Administration
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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8106-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T31
Location:	Hamlet, NY
Latitude:	42-26-26.82N NAD 83
Longitude:	79-06-39.83W
Heights:	1450 feet site elevation (SE)
	499 feet above ground level (AGL)
	1949 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (1949 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8106-OE.

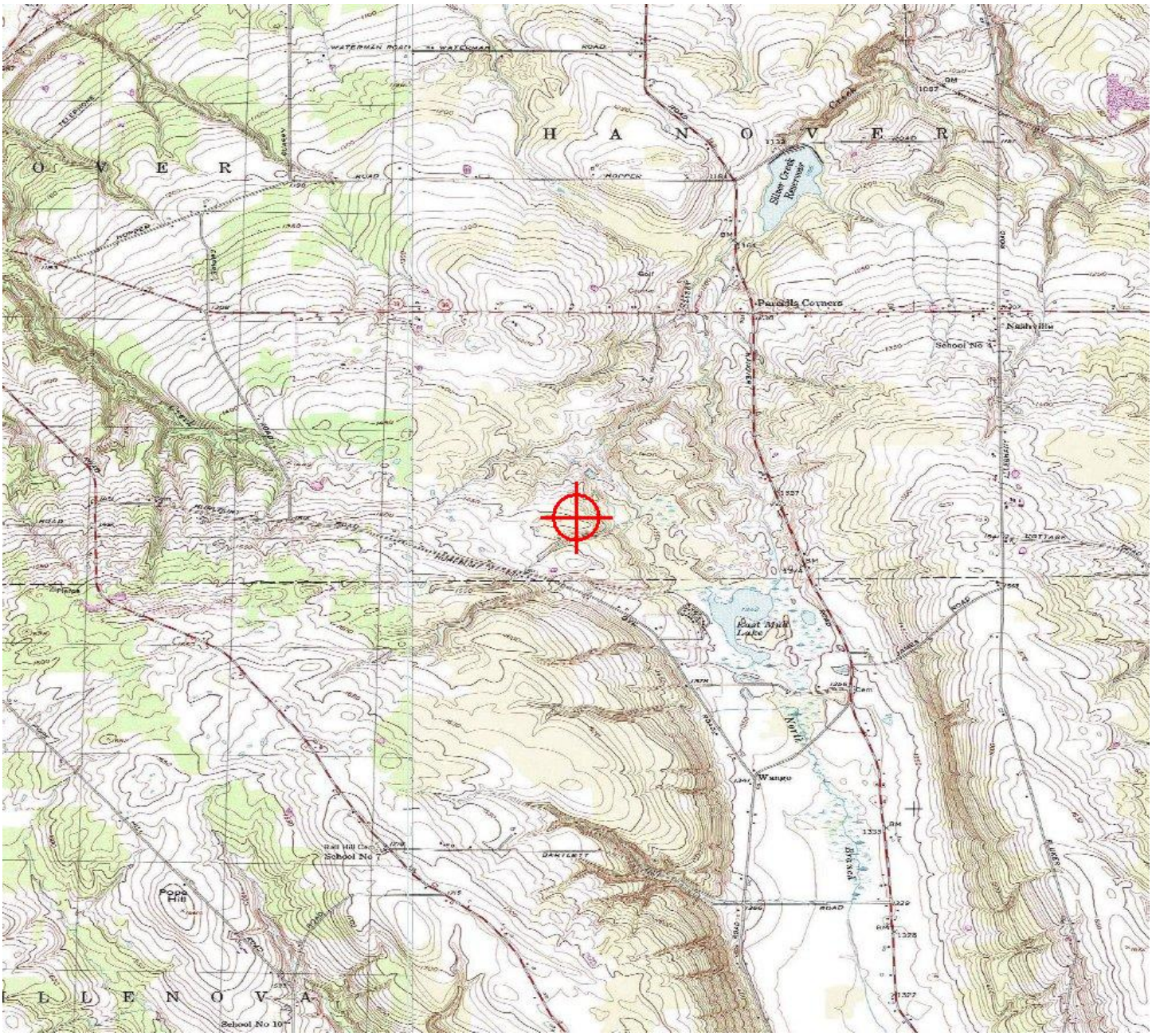
Signature Control No: 273432878-301612383 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8106-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8107-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T32
Location:	Hamlet, NY
Latitude:	42-26-36.87N NAD 83
Longitude:	79-06-55.93W
Heights:	1410 feet site elevation (SE)
	499 feet above ground level (AGL)
	1909 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (1909 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8107-OE.

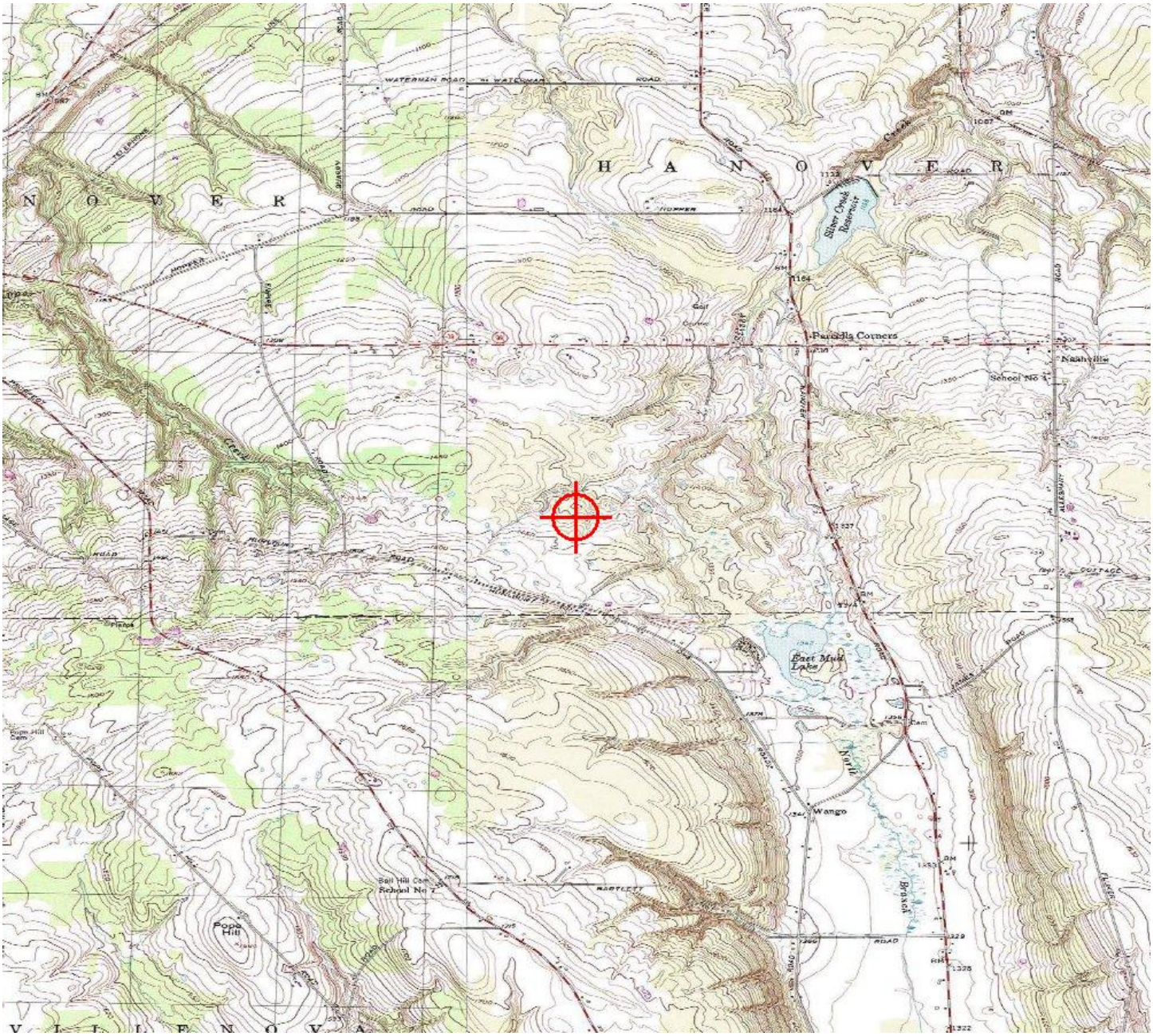
Signature Control No: 273432884-301612386 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

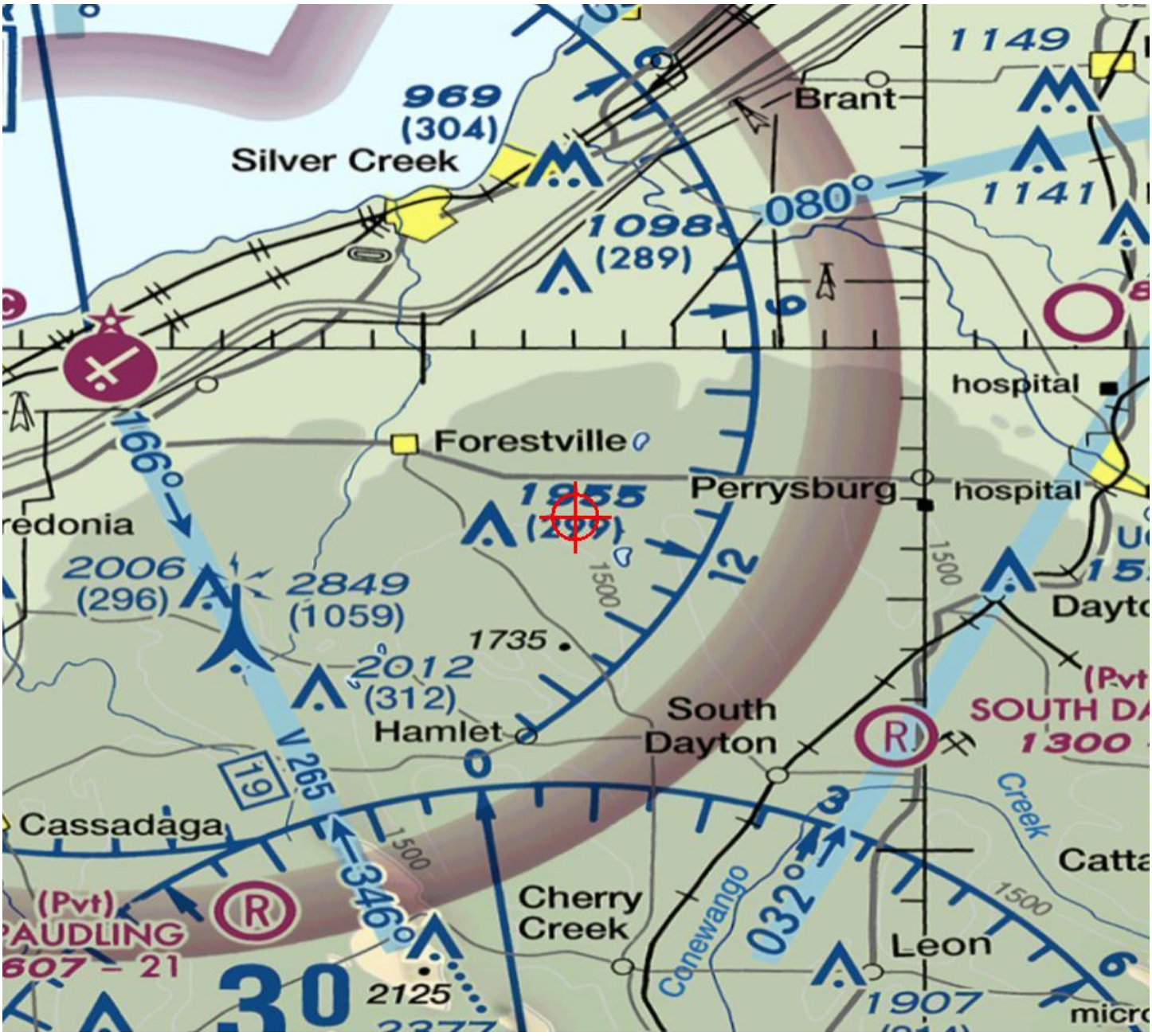
The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8107-OE



Sectional Map for ASN 2015-WTE-8107-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8108-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T33
Location:	Hamlet, NY
Latitude:	42-26-46.95N NAD 83
Longitude:	79-07-12.22W
Heights:	1440 feet site elevation (SE)
	499 feet above ground level (AGL)
	1939 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (1939 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

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This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8108-OE.

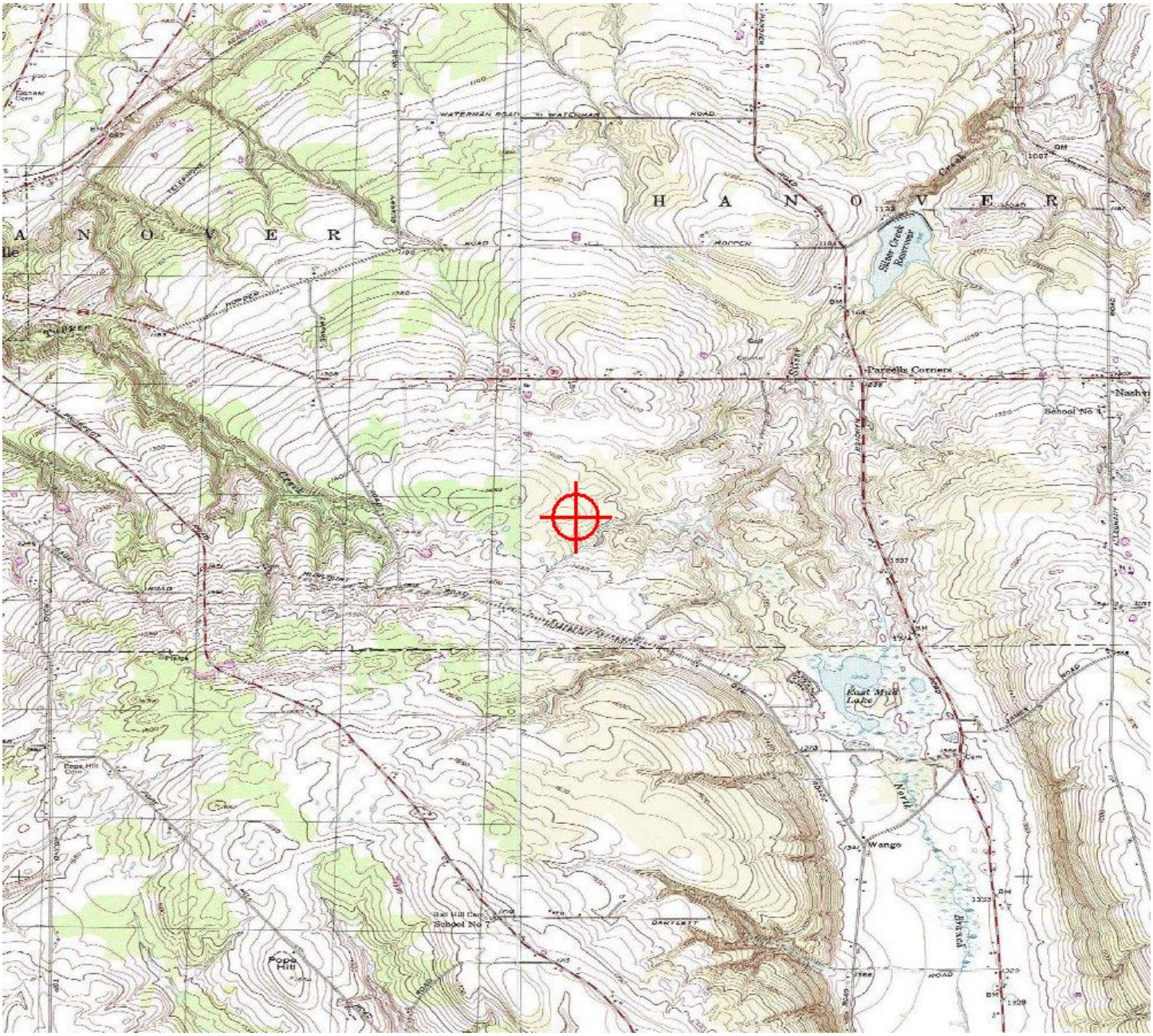
Signature Control No: 273432885-301612389 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8108-OE



Sectional Map for ASN 2015-WTE-8108-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8109-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T34
Location:	Hamlet, NY
Latitude:	42-26-53.98N NAD 83
Longitude:	79-07-30.58W
Heights:	1458 feet site elevation (SE)
	499 feet above ground level (AGL)
	1957 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (1957 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

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Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8109-OE.

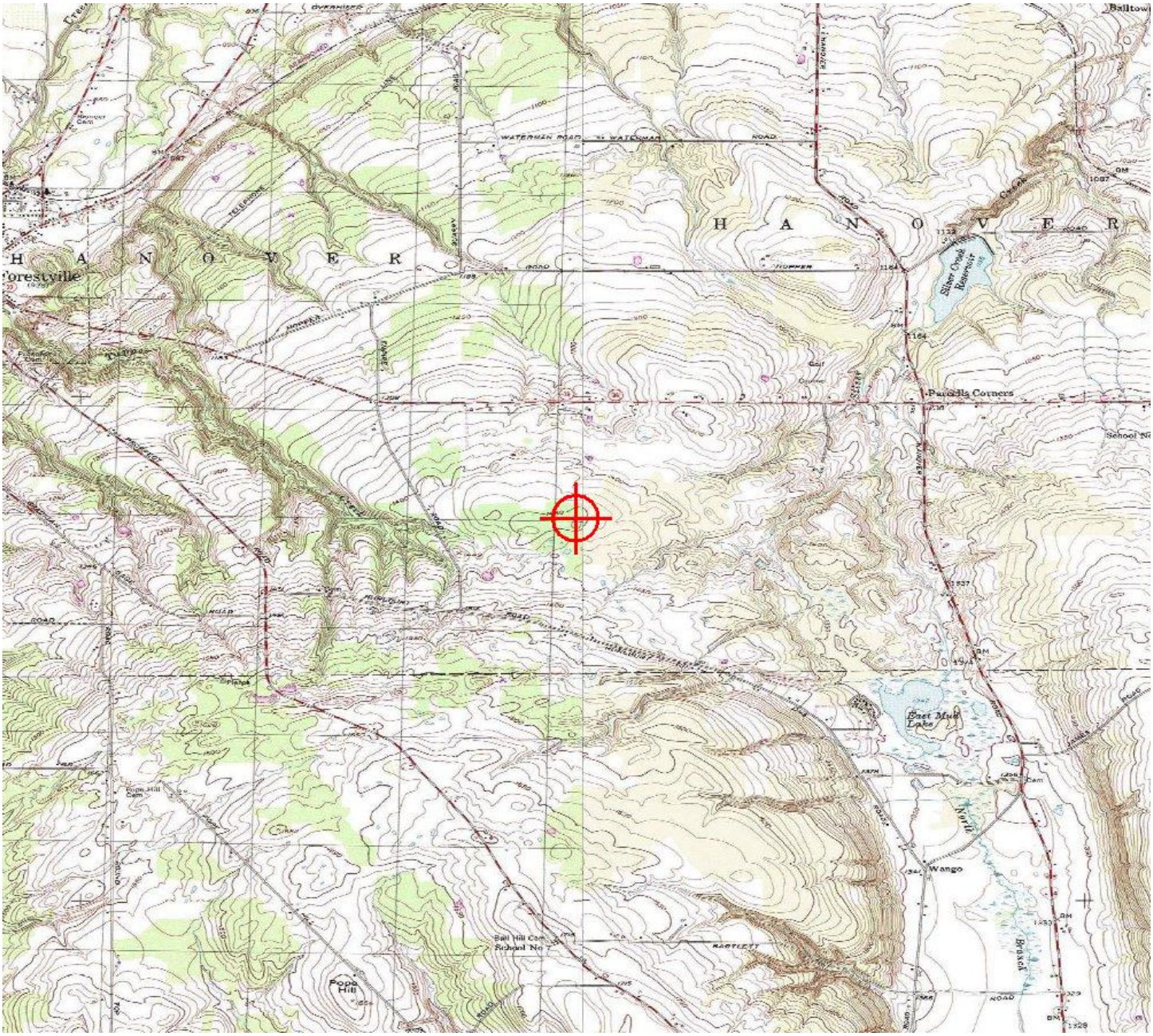
Signature Control No: 273432886-301612392 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8109-OE



Sectional Map for ASN 2015-WTE-8109-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8110-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T35
Location:	Hamlet, NY
Latitude:	42-27-06.65N NAD 83
Longitude:	79-07-51.51W
Heights:	1422 feet site elevation (SE)
	499 feet above ground level (AGL)
	1921 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

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__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (1921 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

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If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8110-OE.

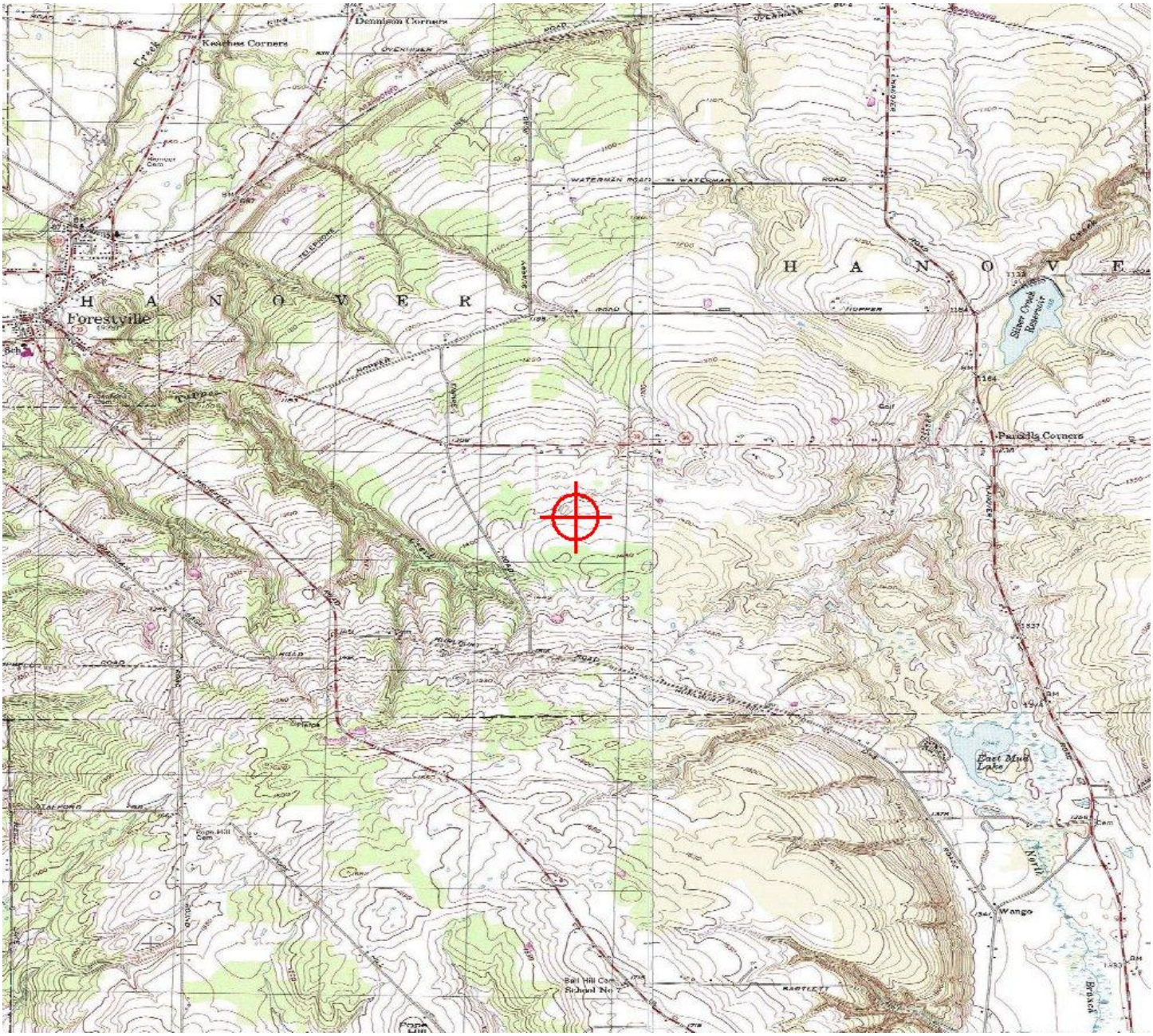
Signature Control No: 273432887-301612396 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8110-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8111-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T36
Location:	Hamlet, NY
Latitude:	42-26-52.77N NAD 83
Longitude:	79-06-15.90W
Heights:	1365 feet site elevation (SE)
	499 feet above ground level (AGL)
	1864 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (1864 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8111-OE.

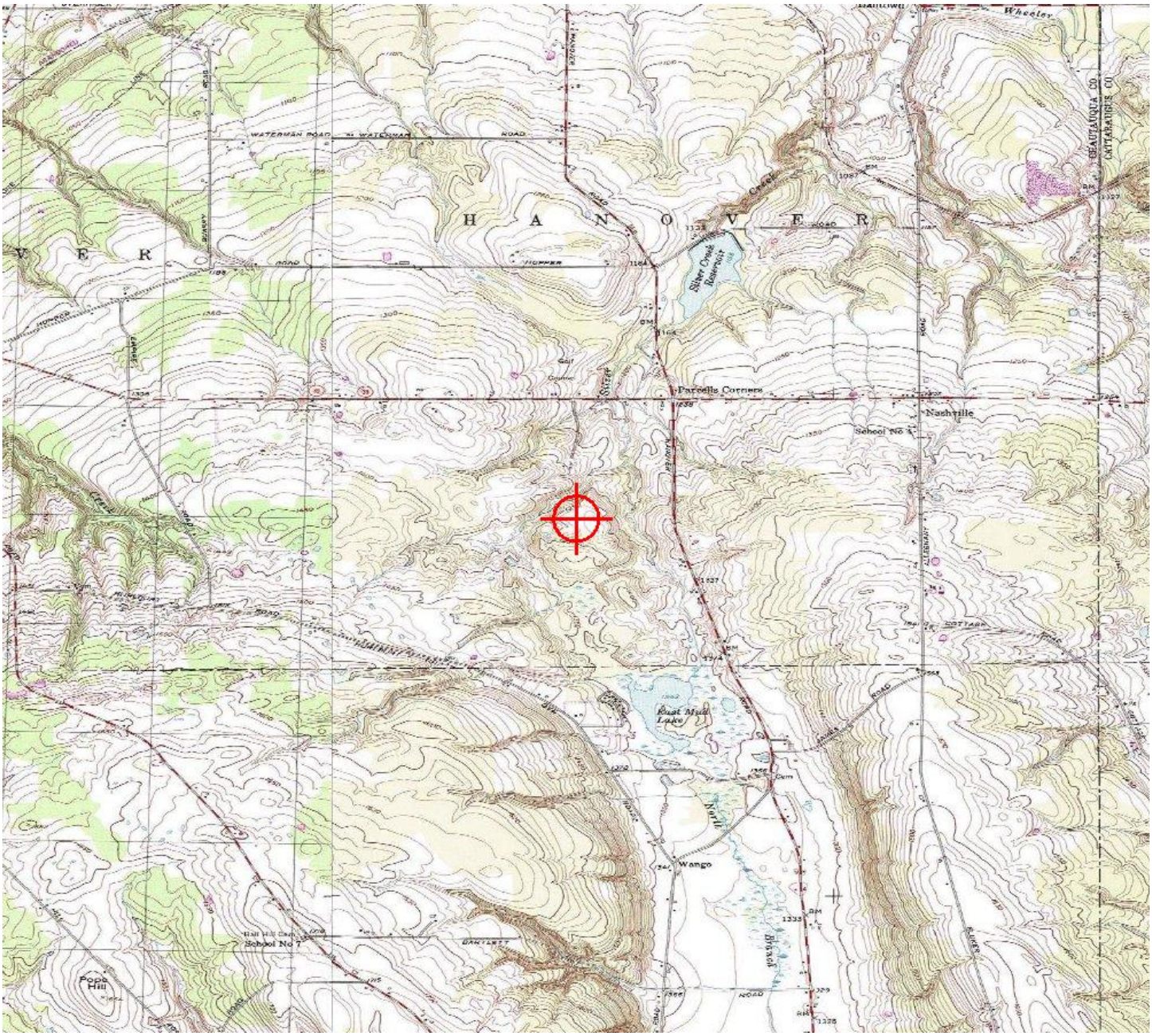
Signature Control No: 273432888-301612399 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8111-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8112-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T37
Location:	Hamlet, NY
Latitude:	42-27-02.38N NAD 83
Longitude:	79-06-38.87W
Heights:	1375 feet site elevation (SE)
	499 feet above ground level (AGL)
	1874 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (1874 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8112-OE.

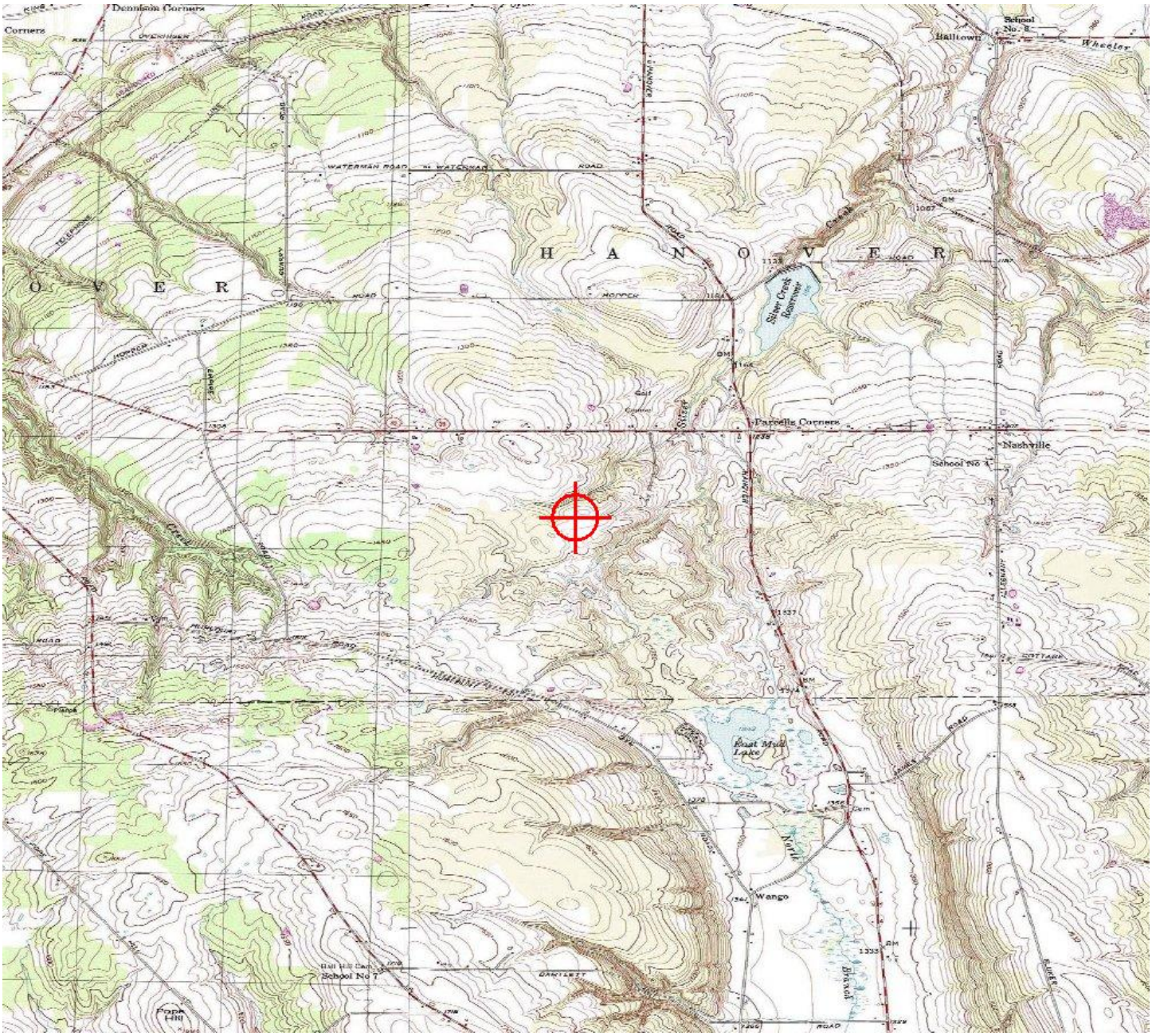
Signature Control No: 273432889-301612402 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8112-OE



Sectional Map for ASN 2015-WTE-8112-OE

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8113-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T38
Location:	Hamlet, NY
Latitude:	42-27-10.32N NAD 83
Longitude:	79-07-10.39W
Heights:	1380 feet site elevation (SE)
	499 feet above ground level (AGL)
	1879 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (1879 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8113-OE.

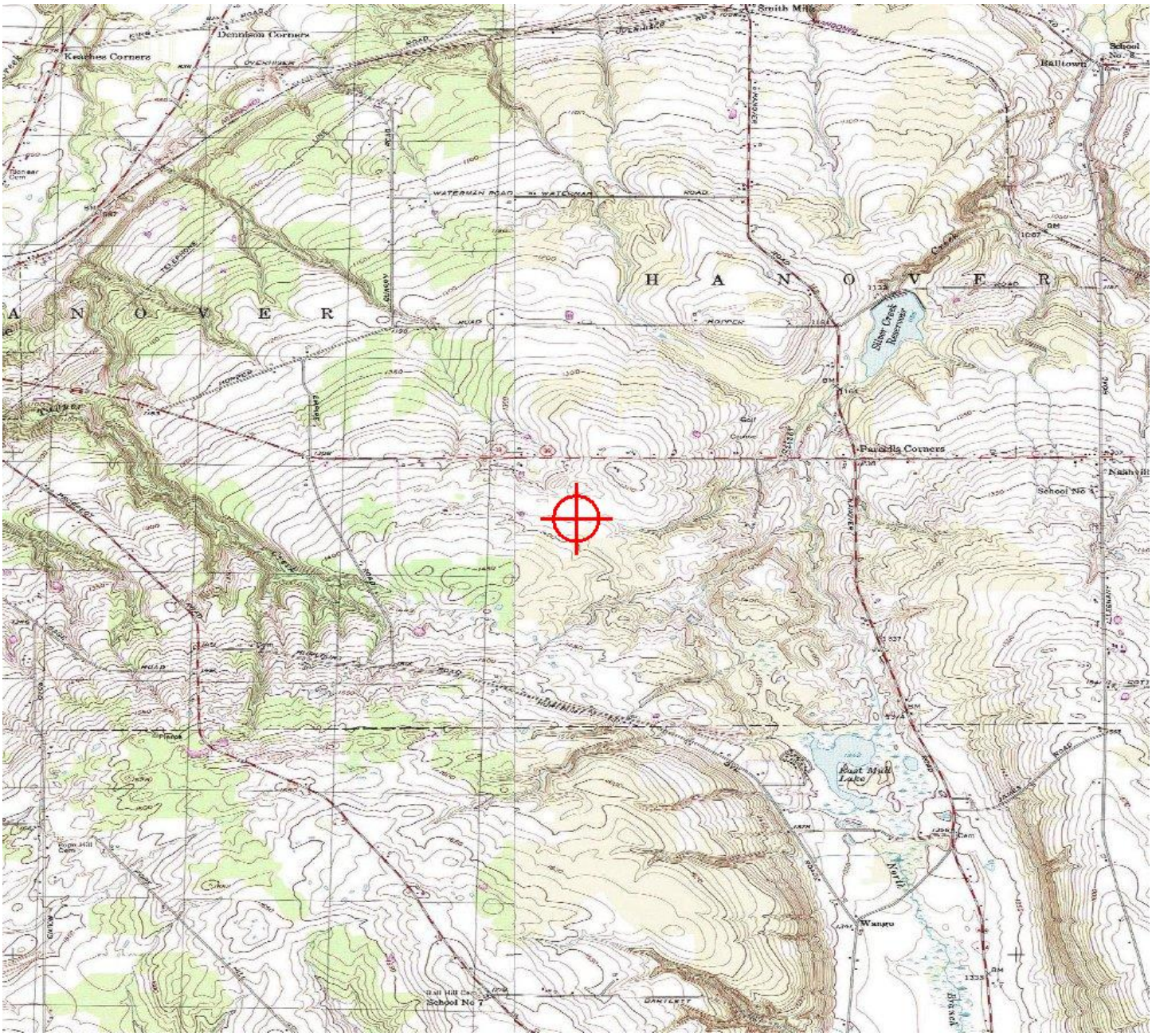
Signature Control No: 273432890-301612411 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8113-OE



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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8114-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine T39
Location:	Hamlet, NY
Latitude:	42-24-13.86N NAD 83
Longitude:	79-10-11.26W
Heights:	1569 feet site elevation (SE)
	499 feet above ground level (AGL)
	2068 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2068 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

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This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8114-OE.

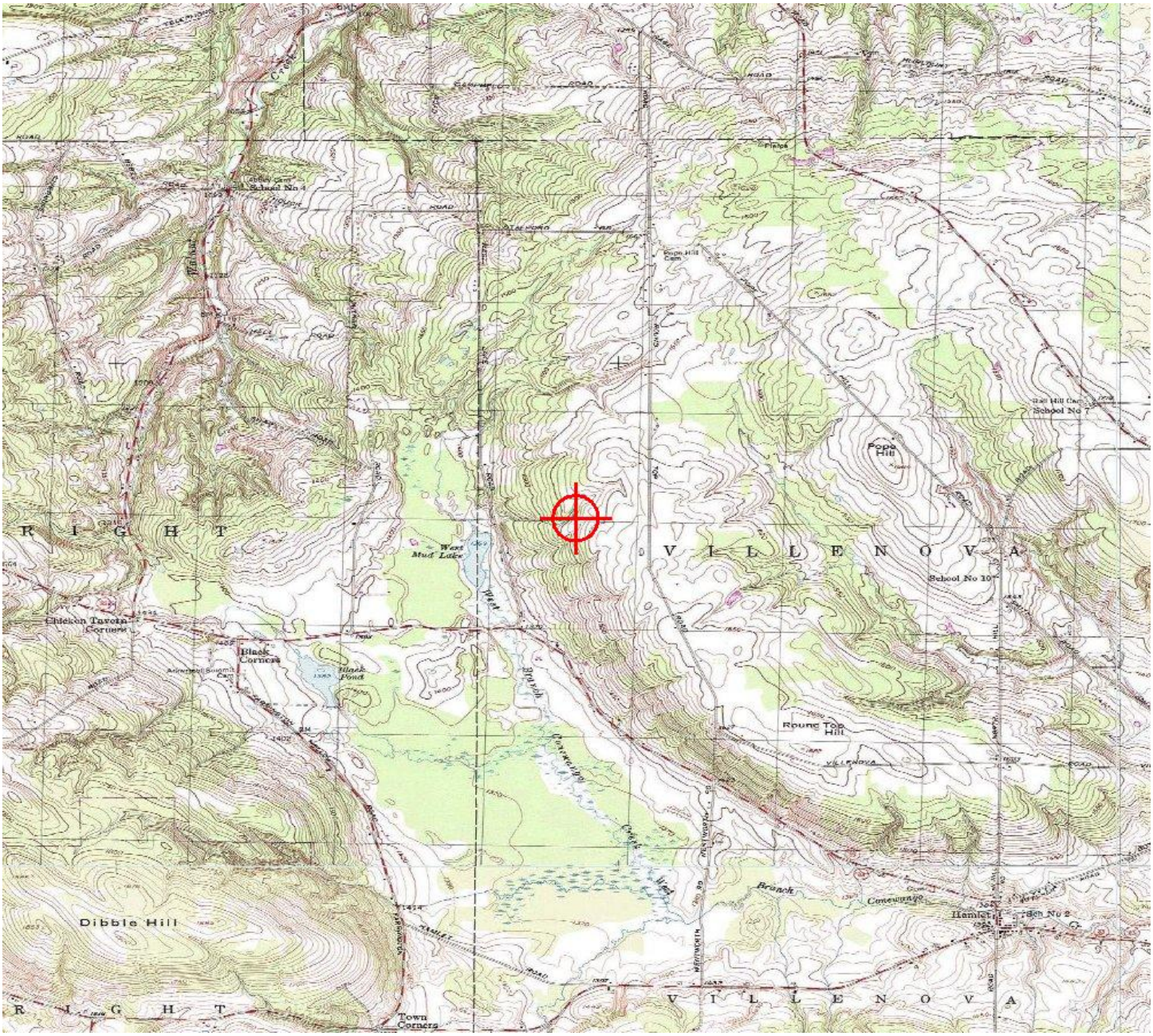
Signature Control No: 273432891-301612416 (DNE -WT)
Brenda Mumper
Specialist

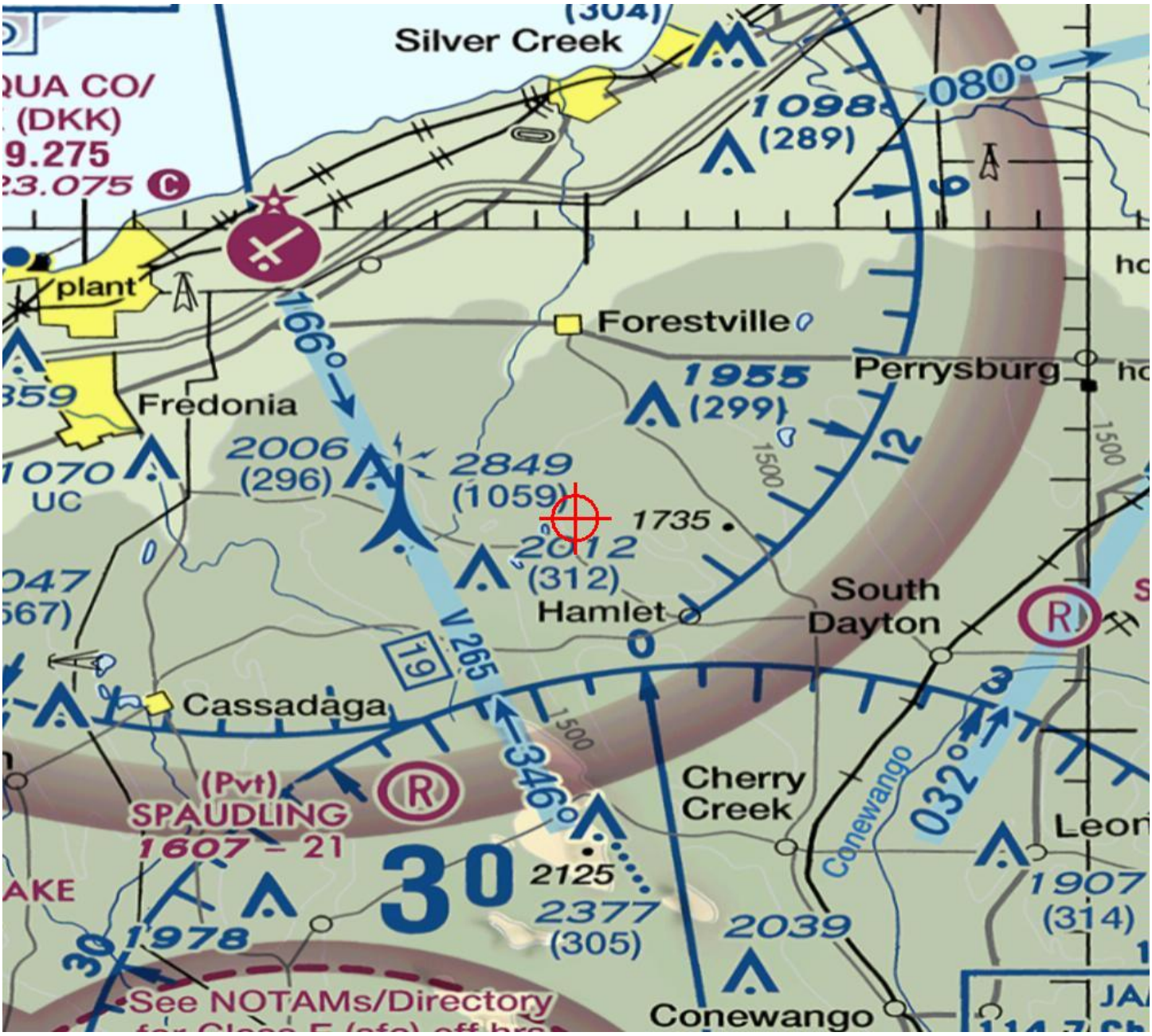
Attachment(s)
Additional Information
Map(s)

The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8114-OE

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Conewango

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8115-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine A1
Location:	Hamlet, NY
Latitude:	42-24-56.64N NAD 83
Longitude:	79-10-14.80W
Heights:	1530 feet site elevation (SE)
	499 feet above ground level (AGL)
	2029 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.
Any height exceeding 499 feet above ground level (2029 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Additional wind turbines or met towers proposed in the future may cause a cumulative effect on the national airspace system. This determination is based, in part, on the foregoing description which includes specific coordinates and heights . Any changes in coordinates will void this determination. Any future construction or alteration requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8115-OE.

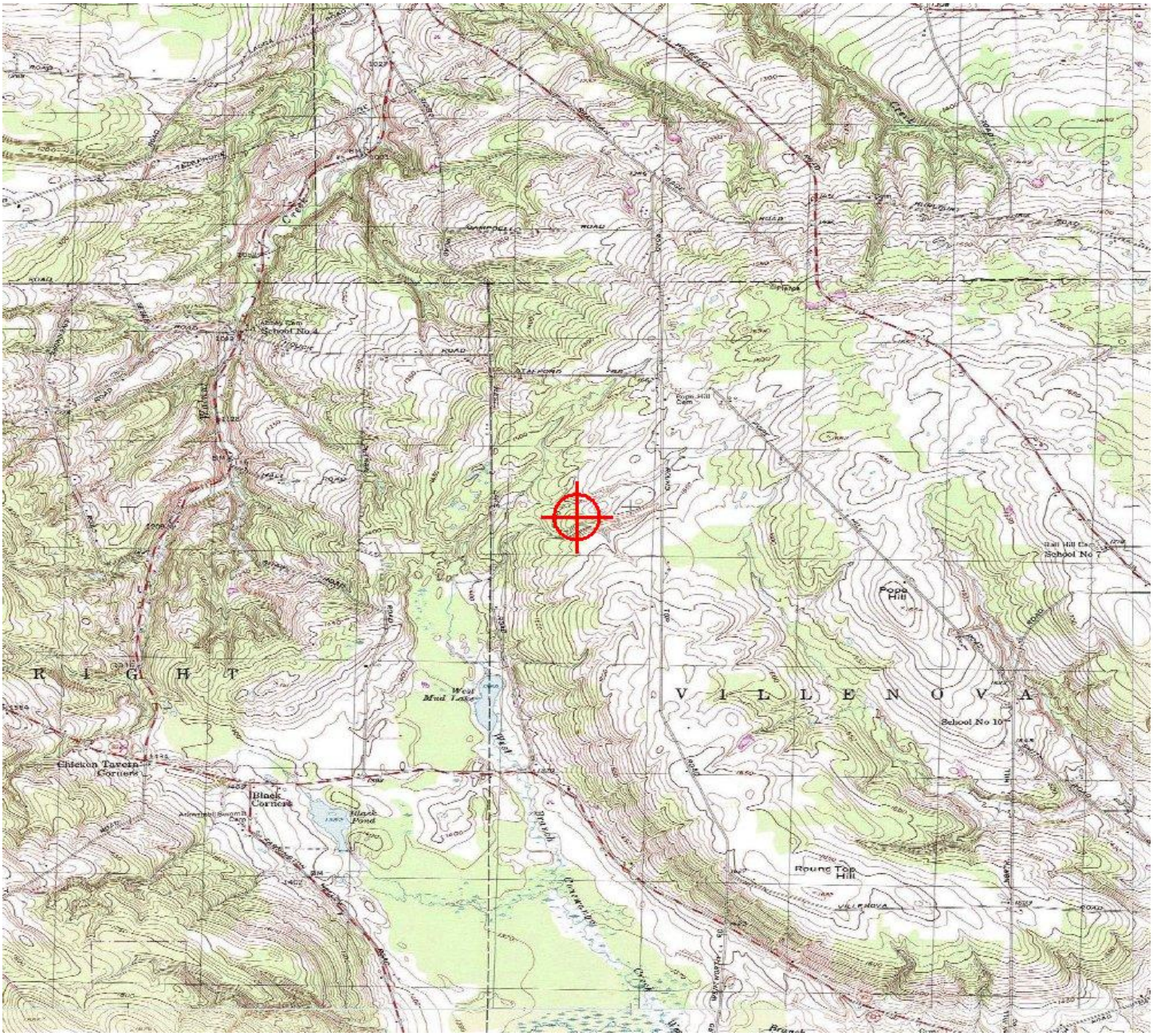
Signature Control No: 273432892-301612418 (DNE -WT)
Brenda Mumper
Specialist

Attachment(s)
Additional Information
Map(s)

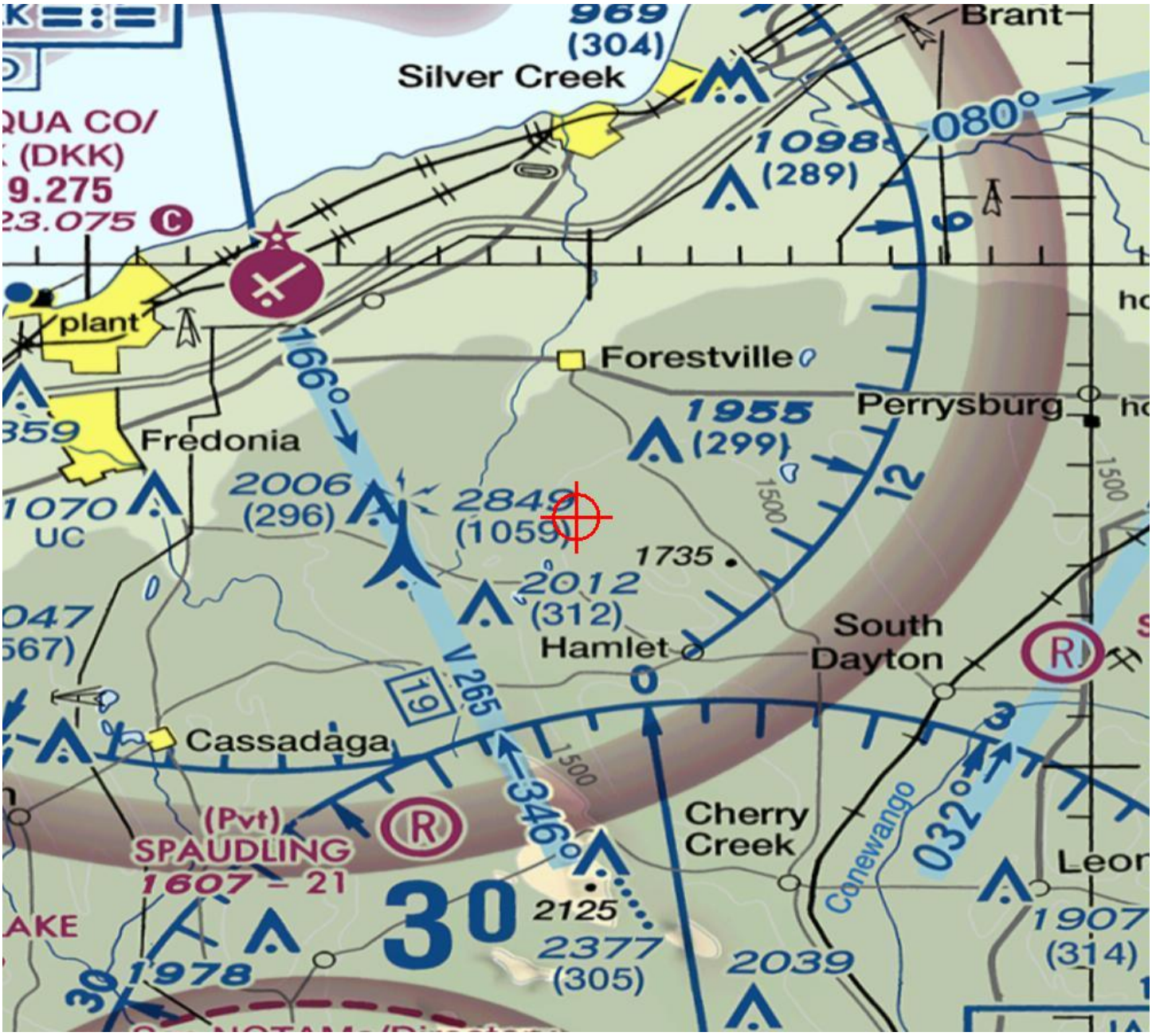
The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

All determinations in this project will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

TOPO Map for ASN 2015-WTE-8115-OE



Sectional Map for ASN 2015-WTE-8115-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8117-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine A3
Location:	Hamlet, NY
Latitude:	42-25-28.86N NAD 83
Longitude:	79-08-55.62W
Heights:	1640 feet site elevation (SE)
	499 feet above ground level (AGL)
	2139 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

Any height exceeding 499 feet above ground level (2139 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before September 10, 2016. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager, Airspace Policy & Regulation, Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on September 20, 2016 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Brenda Mumper, at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8117-OE.

Signature Control No: 273432894-301594059 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

The proposed structures noted in this letter are part of a proposed wind farm that would be located near Hamlet, New York. They would be located from 6.35 to 7.21 nautical miles (NM) southeast of the airport reference point for the Chautauqua County/Dunkirk Airport (DKK) in Dunkirk, New York. The determinations for each of the structures will be available upon issuance on the website, http://oeaaa.faa.gov.

Following are the Aeronautical Study Numbers, coordinates, site elevation, above ground level and above mean sea level heights for each of the proposals:

2015-WTE-8095-OE 42-25-19.11N / 79-08-28.15W 1660 / 499 / 2159
2015-WTE-8117-OE 42-25-28.86N / 79-08-55.62W 1640 / 499 / 2139
2015-WTE-8118-OE 42-25-51.55N / 79-09-21.52W 1605 / 499 / 2104
2015-WTE-8119-OE 42-25-45.90N / 79-09-02.69W 1622 / 499 / 2121

OBSTRUCTION STANDARD(S) EXCEEDED

Section 77.17(a)(3): A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

The proposals would exceed this obstruction standard as noted as applied to DKK:

2015-WTE-8095-OE
Obstacle penetrates Runway 15 Diverse A departure area 14 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8117-OE
Obstacle penetrates Runway 15 Diverse A departure area 46 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8118-OE
Obstacle penetrates Runway 15 Diverse A departure area 87 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8119-OE
Obstacle penetrates Runway 15 Diverse A departure area 71 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

The proposal was circularized on July 29, 2016, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. No comments were received as a result of the circularization.

Aeronautical study disclosed that the structure would have no significant effect on any existing or proposed arrival, departure, or en route instrument flight rule (IFR) operations or procedures. Further study did not

indicate that the IFR impacts noted above would affect a significant number of aircraft operations; therefore, those impacts would not create substantial adverse effect.

Study for possible visual flight rules (VFR) effect disclosed that the proposal would have no effect on any existing or proposed arrival or departure VFR operations or procedures. It would not conflict with airspace required to conduct normal VFR traffic pattern operations at DKK or any other known public-use or military airports. At 499 ft. AGL, the proposed structure would not have a substantial adverse effect on VFR en route flight operations.

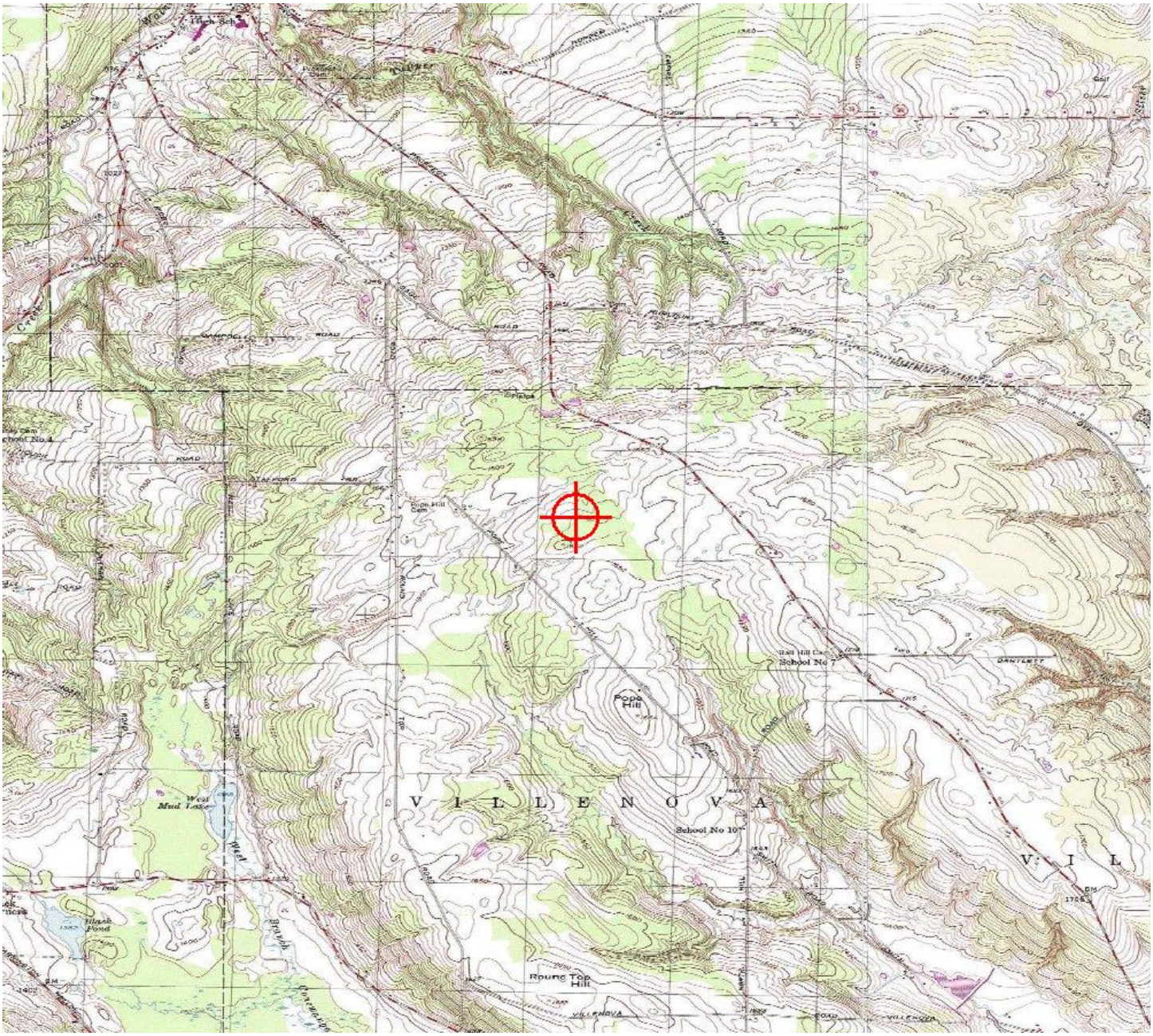
The cumulative impact of the structure, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposal affect the capacity of any known existing or planned public-use or military airport. The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

Therefore, it is determined that the proposed structure would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

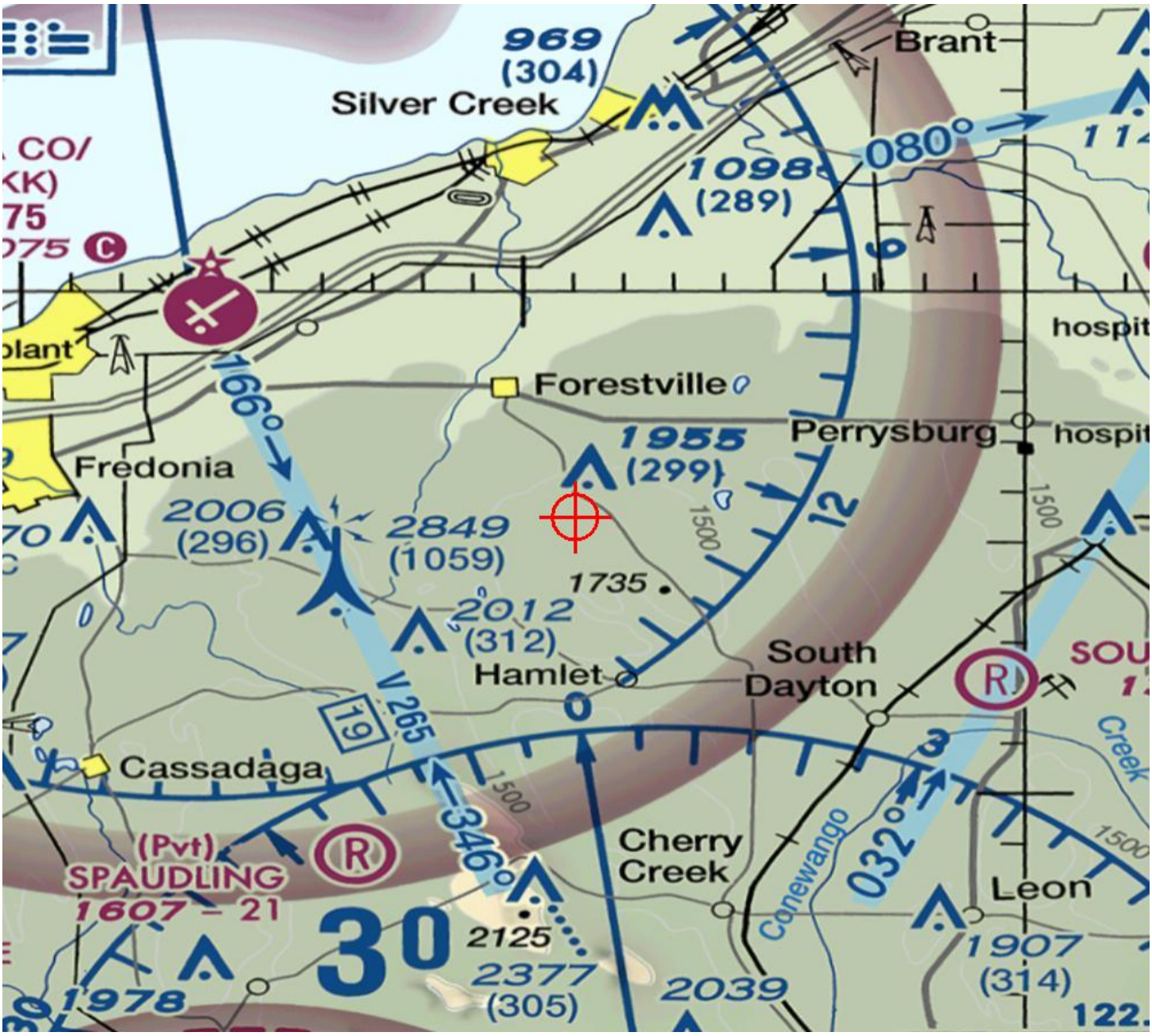
All determinations will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

NOTE: IT IS IMPERATIVE THAT PART 1 OF THE 7460-2 FORM IS SUBMITTED AT LEAST 10 DAYS PRIOR TO BEGINNING CONSTRUCTION SO IFR ALTITUDES MAY BE AMENDED AS REQUIRED.

TOPO Map for ASN 2015-WTE-8117-OE



Sectional Map for ASN 2015-WTE-8117-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8118-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine A4
Location:	Hamlet, NY
Latitude:	42-25-51.55N NAD 83
Longitude:	79-09-21.52W
Heights:	1605 feet site elevation (SE)
	499 feet above ground level (AGL)
	2104 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

Any height exceeding 499 feet above ground level (2104 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before September 10, 2016. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager, Airspace Policy & Regulation, Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on September 20, 2016 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Brenda Mumper, at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8118-OE.

Signature Control No: 273432895-301594057 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

The proposed structures noted in this letter are part of a proposed wind farm that would be located near Hamlet, New York. They would be located from 6.35 to 7.21 nautical miles (NM) southeast of the airport reference point for the Chautauqua County/Dunkirk Airport (DKK) in Dunkirk, New York. The determinations for each of the structures will be available upon issuance on the website, http://oeaaa.faa.gov.

Following are the Aeronautical Study Numbers, coordinates, site elevation, above ground level and above mean sea level heights for each of the proposals:

2015-WTE-8095-OE 42-25-19.11N / 79-08-28.15W 1660 / 499 / 2159
2015-WTE-8117-OE 42-25-28.86N / 79-08-55.62W 1640 / 499 / 2139
2015-WTE-8118-OE 42-25-51.55N / 79-09-21.52W 1605 / 499 / 2104
2015-WTE-8119-OE 42-25-45.90N / 79-09-02.69W 1622 / 499 / 2121

OBSTRUCTION STANDARD(S) EXCEEDED

Section 77.17(a)(3): A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

The proposals would exceed this obstruction standard as noted as applied to DKK:

2015-WTE-8095-OE
Obstacle penetrates Runway 15 Diverse A departure area 14 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8117-OE
Obstacle penetrates Runway 15 Diverse A departure area 46 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8118-OE
Obstacle penetrates Runway 15 Diverse A departure area 87 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8119-OE
Obstacle penetrates Runway 15 Diverse A departure area 71 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

The proposal was circularized on July 29, 2016, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. No comments were received as a result of the circularization.

Aeronautical study disclosed that the structure would have no significant effect on any existing or proposed arrival, departure, or en route instrument flight rule (IFR) operations or procedures. Further study did not

indicate that the IFR impacts noted above would affect a significant number of aircraft operations; therefore, those impacts would not create substantial adverse effect.

Study for possible visual flight rules (VFR) effect disclosed that the proposal would have no effect on any existing or proposed arrival or departure VFR operations or procedures. It would not conflict with airspace required to conduct normal VFR traffic pattern operations at DKK or any other known public-use or military airports. At 499 ft. AGL, the proposed structure would not have a substantial adverse effect on VFR en route flight operations.

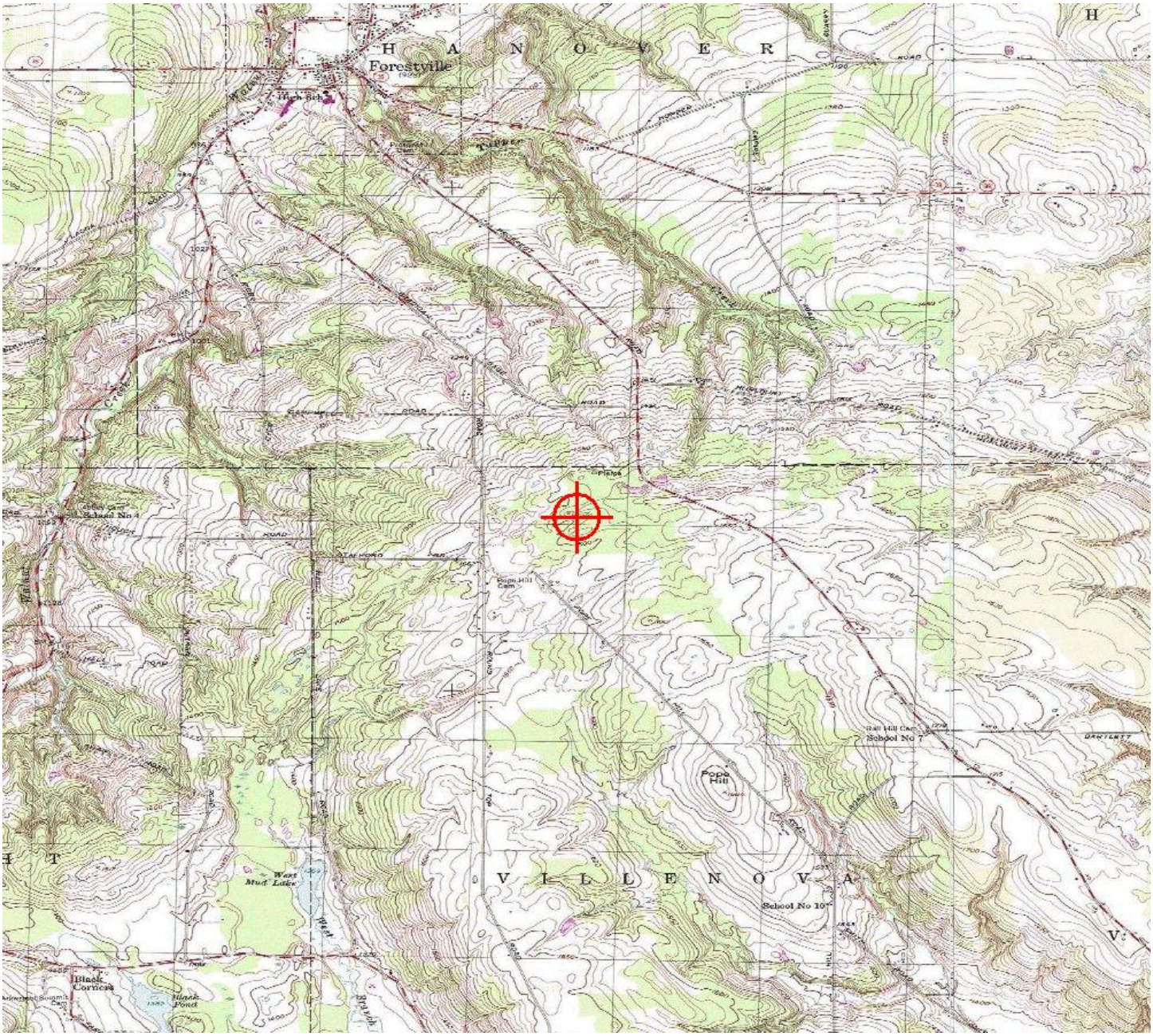
The cumulative impact of the structure, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposal affect the capacity of any known existing or planned public-use or military airport. The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

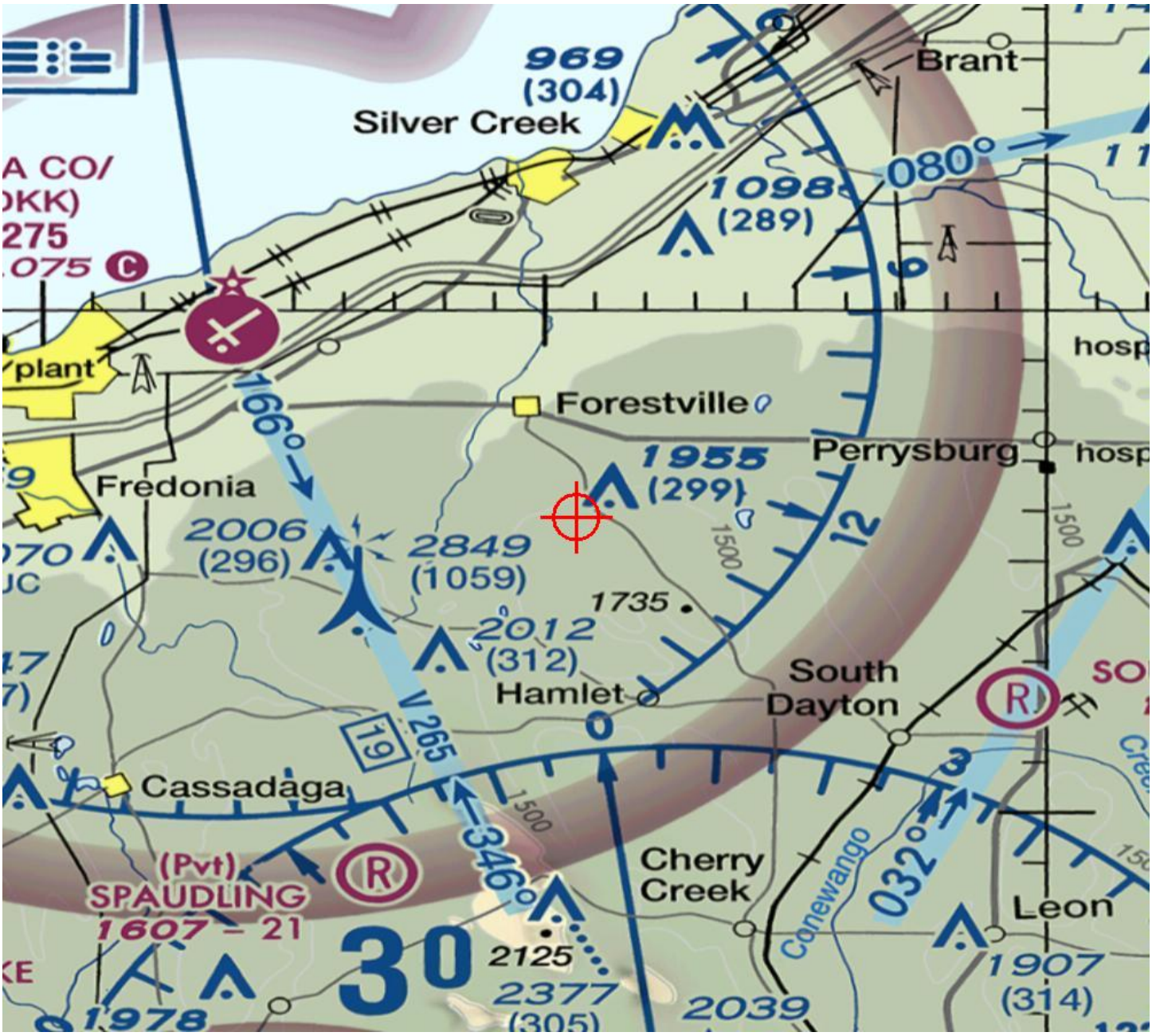
Therefore, it is determined that the proposed structure would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

All determinations will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

NOTE: IT IS IMPERATIVE THAT PART 1 OF THE 7460-2 FORM IS SUBMITTED AT LEAST 10 DAYS PRIOR TO BEGINNING CONSTRUCTION SO IFR ALTITUDES MAY BE AMENDED AS REQUIRED.

TOPO Map for ASN 2015-WTE-8118-OE

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1607 – 21
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Cherry
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Canewango
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Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2015-WTE-8119-OE

Issued Date: 08/11/2016

Elizabeth King
Ball Hill Wind Energy, LLC
11101 W 120th Ave.
Suite 400
Broomfield, CO 80021

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine A5
Location:	Hamlet, NY
Latitude:	42-25-45.90N NAD 83
Longitude:	79-09-02.69W
Heights:	1622 feet site elevation (SE)
	499 feet above ground level (AGL)
	2121 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked/lighted in accordance with FAA Advisory circular 70/7460-1 L, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

__X__ At least 10 days prior to start of construction (7460-2, Part 1)
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

Any height exceeding 499 feet above ground level (2121 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 02/11/2018 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before September 10, 2016. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager, Airspace Policy & Regulation, Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on September 20, 2016 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

Obstruction marking and lighting recommendations for wind turbine farms are based on the scheme for the entire project. ANY change to the height, location or number of turbines within this project will require a reanalysis of the marking and lighting recommendation for the entire project. In particular, the removal of previously planned or built turbines/turbine locations from the project will often result in a change in the marking/lighting recommendation for other turbines within the project. It is the proponent's responsibility to contact the FAA to discuss the process for developing a revised obstruction marking and lighting plan should this occur.

In order to ensure proper conspicuity of turbines at night during construction, all turbines should be lit with temporary lighting once they reach a height of 200 feet or greater until such time the permanent lighting configuration is turned on. As the height of the structure continues to increase, the temporary lighting should be relocated to the uppermost part of the structure. The temporary lighting may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. An FAA Type L-810 steady red light fixture shall be used to light the structure during the construction phase. If power is not available, turbines shall be lit with self-contained, solar powered LED steady red light fixture that meets the photometric requirements of an FAA Type L-810 lighting system. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level. The use of a NOTAM (D) to not light turbines within a project until the entire project has been completed is prohibited.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).

If we can be of further assistance, please contact Brenda Mumper, at (816) 329-2524. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2015-WTE-8119-OE.

Signature Control No: 273432896-301594058 (DNH -WT)
Mike Helvey
Manager, Obstruction Evaluation Group

Attachment(s)
Additional Information
Map(s)

The proposed structures noted in this letter are part of a proposed wind farm that would be located near Hamlet, New York. They would be located from 6.35 to 7.21 nautical miles (NM) southeast of the airport reference point for the Chautauqua County/Dunkirk Airport (DKK) in Dunkirk, New York. The determinations for each of the structures will be available upon issuance on the website, http://oeaaa.faa.gov.

Following are the Aeronautical Study Numbers, coordinates, site elevation, above ground level and above mean sea level heights for each of the proposals:

2015-WTE-8095-OE 42-25-19.11N / 79-08-28.15W 1660 / 499 / 2159
2015-WTE-8117-OE 42-25-28.86N / 79-08-55.62W 1640 / 499 / 2139
2015-WTE-8118-OE 42-25-51.55N / 79-09-21.52W 1605 / 499 / 2104
2015-WTE-8119-OE 42-25-45.90N / 79-09-02.69W 1622 / 499 / 2121

OBSTRUCTION STANDARD(S) EXCEEDED

Section 77.17(a)(3): A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance.

The proposals would exceed this obstruction standard as noted as applied to DKK:

2015-WTE-8095-OE
Obstacle penetrates Runway 15 Diverse A departure area 14 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8117-OE
Obstacle penetrates Runway 15 Diverse A departure area 46 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8118-OE
Obstacle penetrates Runway 15 Diverse A departure area 87 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

2015-WTE-8119-OE
Obstacle penetrates Runway 15 Diverse A departure area 71 feet requiring Take-off Minimum and (Obstacle) Departure Procedures, Runway 15, std. with a min climb gradient increase from 354 feet per NM to 2600 (an increase from 2000).

The proposal was circularized on July 29, 2016, to all known aviation interests and to non-aeronautical interests that may be affected by the proposal. No comments were received as a result of the circularization.

Aeronautical study disclosed that the structure would have no significant effect on any existing or proposed arrival, departure, or en route instrument flight rule (IFR) operations or procedures. Further study did not

indicate that the IFR impacts noted above would affect a significant number of aircraft operations; therefore, those impacts would not create substantial adverse effect.

Study for possible visual flight rules (VFR) effect disclosed that the proposal would have no effect on any existing or proposed arrival or departure VFR operations or procedures. It would not conflict with airspace required to conduct normal VFR traffic pattern operations at DKK or any other known public-use or military airports. At 499 ft. AGL, the proposed structure would not have a substantial adverse effect on VFR en route flight operations.

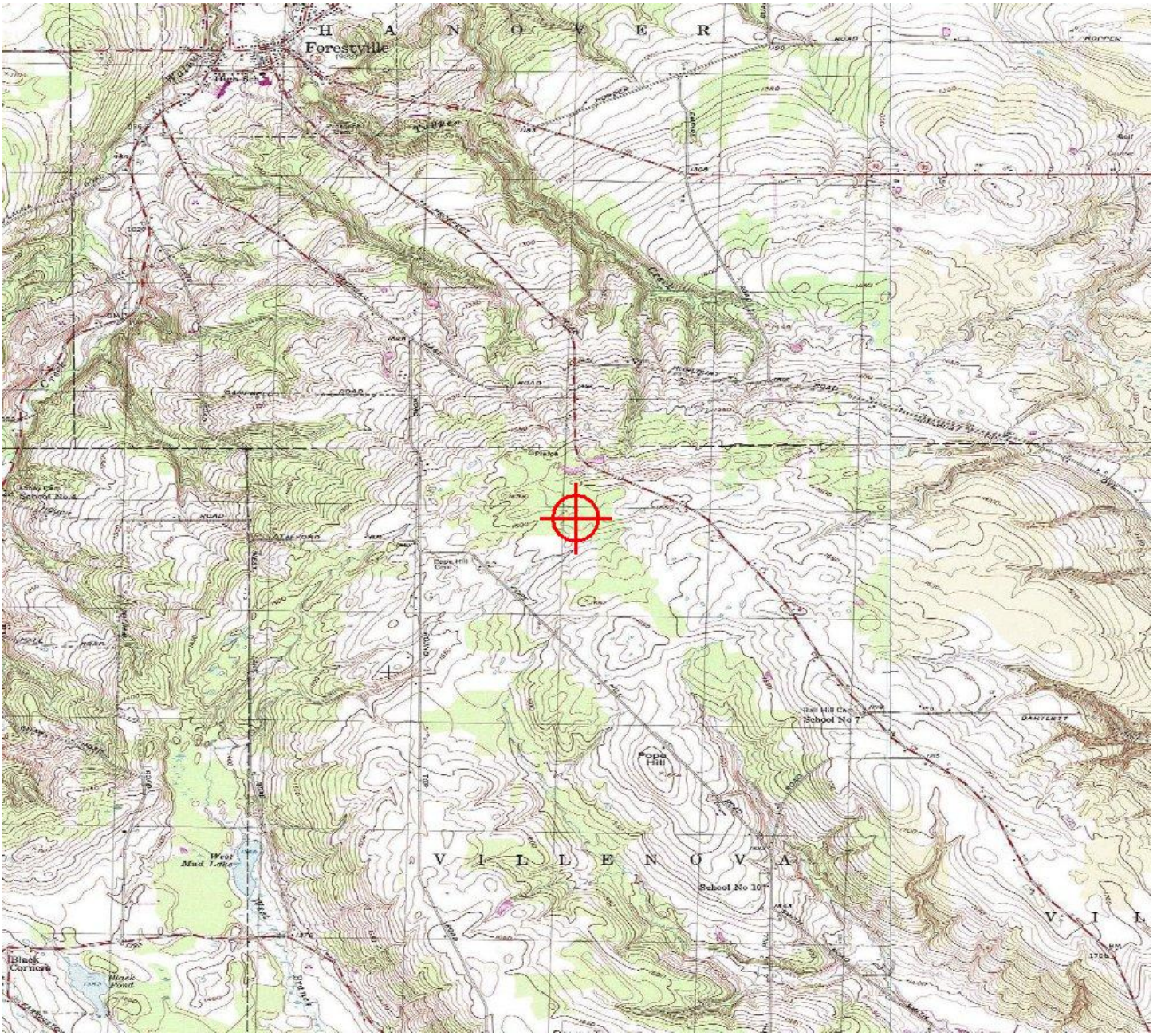
The cumulative impact of the structure, when combined with other proposed and existing structures, is not considered to be significant. Study did not disclose any adverse effect on existing or proposed public-use or military airports or navigational facilities, nor would the proposal affect the capacity of any known existing or planned public-use or military airport. The FAA's Technical Operations office noted impacts to the Buffalo Airport Surveillance Radar; however, the affected Air Traffic Control facilities indicated that the radar impacts would not have a significant effect on their operations.

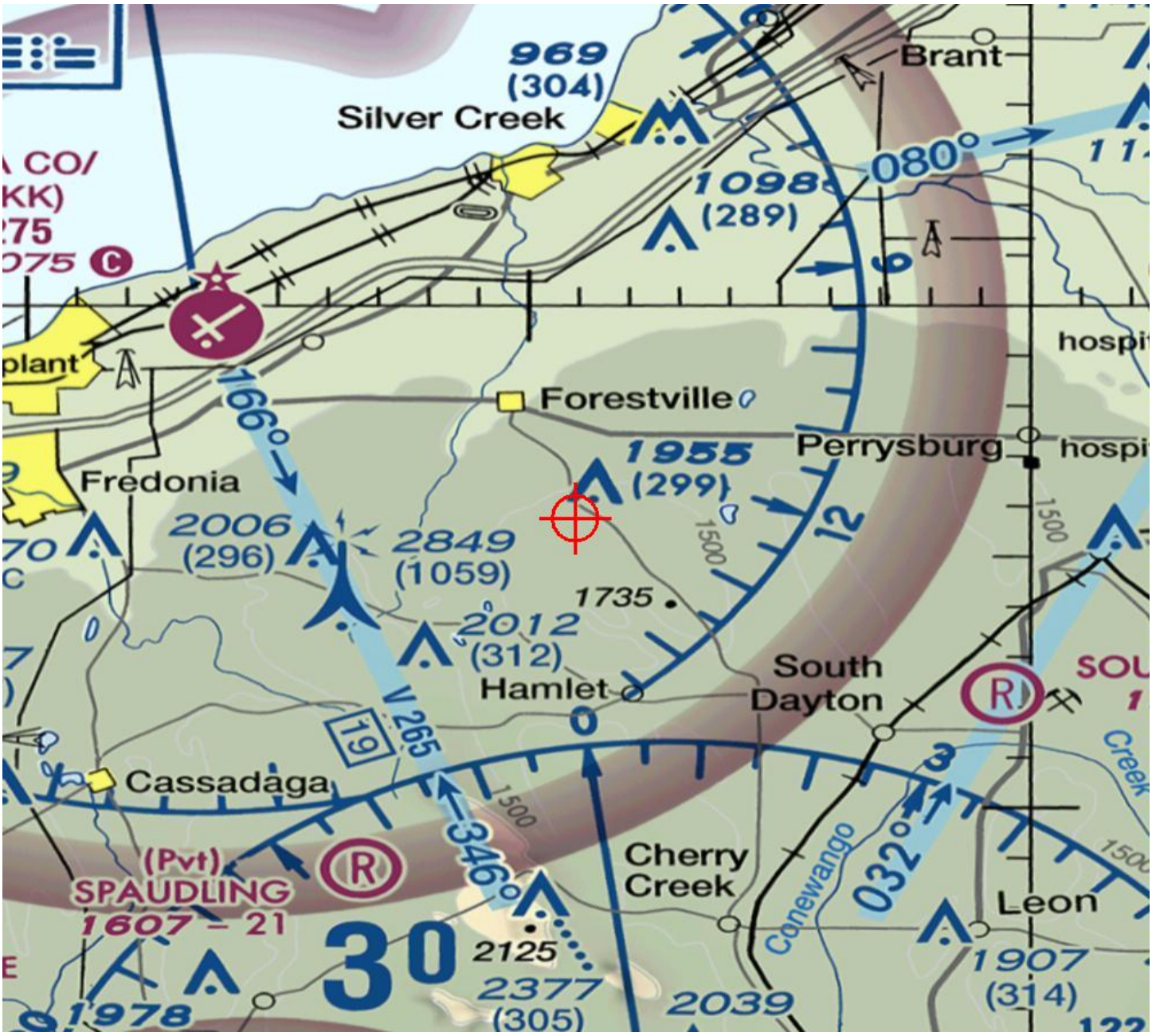
Therefore, it is determined that the proposed structure would not have a substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on any air navigation facility and would not be a hazard to air navigation.

All determinations will be issued with an obstruction marking and lighting condition of white paint and synchronized red lights. When the proponent confirms that the layout is final (no changes, no additions, no removals) and all turbines can and will be built at their determined location and height, the sponsor may request a re-evaluation. The request may be e-mailed to Brenda Mumper (brenda.mumper@faa.gov). A portion of the turbines may qualify for the removal of the lighting recommendation.

NOTE: IT IS IMPERATIVE THAT PART 1 OF THE 7460-2 FORM IS SUBMITTED AT LEAST 10 DAYS PRIOR TO BEGINNING CONSTRUCTION SO IFR ALTITUDES MAY BE AMENDED AS REQUIRED.

TOPO Map for ASN 2015-WTE-8119-OE




969
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G-3 New York State Department of Environmental Conservation

FISHER ASSOCIATES

Transportation
Land Development
Energy

August 11, 2016

NYSDEC - Information Services
New York Natural Heritage Program
625 Broadway, 5th Floor
Albany, N.Y. 12233-4757
{via email}

Re: Ball Hill Wind Energy
Towns of Hanover and Villenova, Chautauqua County, N.Y.

To whom it may concern:

Fisher Associates, P.E., L.S., L.A., D.P.C ("Fisher Associates"), on behalf of Ball Hill Wind Energy LLC, is requesting an updated database review for the Ball Hill Wind Energy facility project area (see attached Location Map). Previous correspondence relative to the Project are attached for your reference.

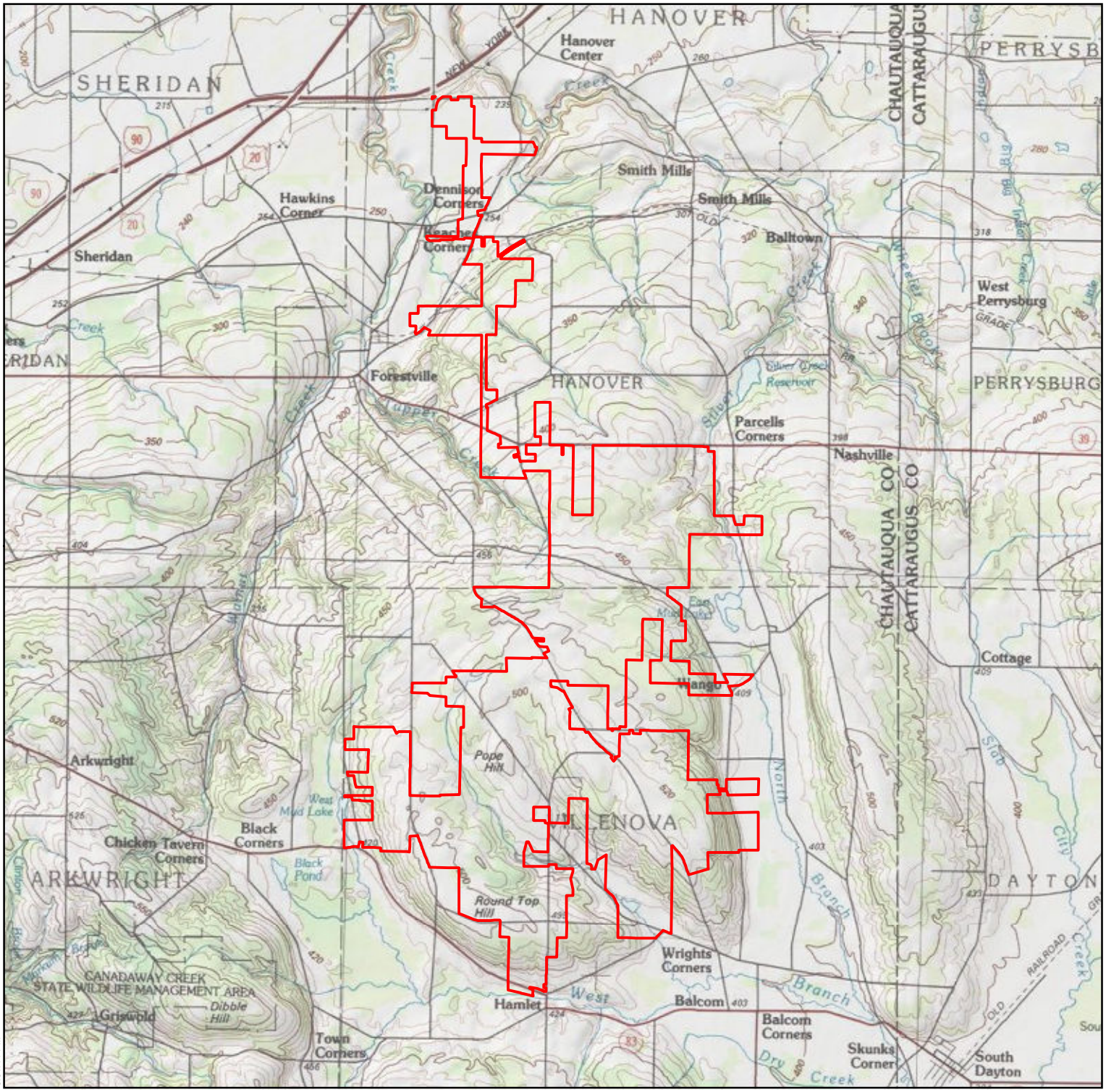
Thank you in advance for your assistance. If you have any questions please feel free to contact me via email (pmccarthy@fisherassoc.com) or phone at 716-858-1234 ext 307.

Sincerely,

FISHER ASSOCIATES, P.E., L.S., L.A., D.P.C.

Patrick McCarthy
Project Manager

Enclosure
cc: Frank Armento, Fisher Associates



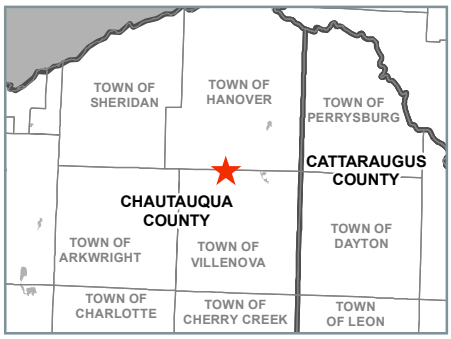
Project USGS Quad(s): Silver Creek, Forestville, Perrysburg	Project Watershed(s): Chautauqua-Conneaut (HUC 04120101) Conewango (HUC 05010002)	Project Study Limits: 656.56 Acres Center of Project Study Limits: 42.440 N, -79.128 W North American Datum 1983

Project Boundary

Data Sources:

United States Geological Survey 24k Topo Quad Map - usgs.gov

Author: AK | Revision Date: 8/11/2016



0 0.75 1.5 Miles

FISHER ASSOCIATES

BALL HILL WIND ENERGY, LLC.
BILL HILL WIND PROJECT
LOCATION MAP

J:\Projects\150001-Ball_Hill_Wind_ENV\GIS\Ball_Hill_Project_Location_Map.mxd - 3:31:41 PM

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

March 17, 2015

Patrick McCarthy
Fisher Associates
325 Delaware Avenue, Suite 200
Buffalo, NY 14202

Dear Mr. McCarthy:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the environmental assessment for the potential wind energy development, located in the Towns of Hanover and Villenova, Chautauqua County.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities, that our database indicates occur, or may occur, on your site or in the immediate vicinity of your site. Also enclosed is a report of rare birds documented within 10 miles of the project site, for use in assessing potential impacts of bird collisions. (We have no records of rare bat hibernacula or roost sites within 40 miles of the site. However, we are currently in the process of entering Northern Long-eared Bat summer locations in our database. For more complete information on the proximity of the site to Northern Long-eared Bat summer locations, please resubmit your project for review in 2-3 months.) For information on NYSDEC's environmental review of proposed wind energy projects, and for the document *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects*, please go to www.dec.ny.gov/energy/66494.html.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Nicholas B. Conrad
Information Resources Coordinator
NY Natural Heritage Program

The following state-listed animals have been documented in the vicinity of your project site.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing.

For information about potential impacts of your project on these populations, how to avoid, minimize, or mitigate any impacts, and any permit considerations, contact the Wildlife Manager or the Fisheries Manager at the NYSDEC Regional Office for the region where the project is located. A listing of Regional Offices is at http://www.dec.ny.gov/about/558.html.

The following species have been documented within 0.3 mi of the project site. Individual animals may travel 1 mi from documented locations.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*FEDERAL LISTING*	
Birds				
Bald Eagle *Breeding*	*Haliaeetus leucocephalus*	Threatened		12661

This report only includes records from the NY Natural Heritage database. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

The following rare plants, rare animals, and significant natural communities have been documented at your project site, or in its vicinity.

We recommend that potential onsite and offsite impacts of the proposed project on these species or communities be addressed as part of any environmental assessment or review conducted as part of the planning, permitting and approval process, such as reviews conducted under SEQR. Field surveys of the project site may be necessary to determine the status of a species at the site, particularly for sites that are currently undeveloped and may still contain suitable habitat. Final requirements of the project to avoid, minimize, or mitigate potential impacts are determined by the lead permitting agency or the government body approving the project.

The following significant natural communities are considered significant from a statewide perspective by the NY Natural Heritage Program. They are either occurrences of a community type that is rare in the state, or a high-quality example of a more common community type. By meeting specific, documented criteria, the NY Natural Heritage Program considers these community occurrences to have high ecological and conservation value.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*

Wetland/Aquatic Communities

Rich Hemlock-Hardwood Peat Swamp — High-Quality Occurrence of Rare Community Type

West Mud Lake Swamp: Excellent quality, with history of some selective logging followed by very good recovery. Community is well-buffered. Minimal disturbance and good size. 961

Shrub Swamp — High-Quality Occurrence

East Mud Lake: Of good size and biologically diverse, with some cottages on the lake shore. Uplands around the wetlands are primarily farm fields. There were no exotics observed. 3633

The following plants are listed as Endangered or Threatened by New York State, and/or are considered rare by the New York Natural Heritage Program, and so are a vulnerable natural resource of conservation concern.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*

Vascular Plants

Butterwort — *Pinguicula vulgaris* — Threatened — Imperiled in NYS

Walnut Creek Gorge, 1992-06-28: Wet shale cliffs that are verticle, sun-free, east-facing, and continuously wet. The substrate and soils probably have a calcareous component. 4618

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at

www.natureserve.org/explorer, and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

Information about many of the natural community types in New York, including identification, dominant and characteristic vegetation, distribution, conservation, and management, is available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org. For descriptions of all community types, go to www.dec.ny.gov/animals/97703.html for Ecological Communities of New York State.

The following rare animals have been documented in the general vicinity of your proposed wind power project.

The impacts of wind turbines on animals include both impacts due to disturbance at the site of the turbines, and impacts due to flying birds and bats colliding with turbine blades. Therefore, when screening proposed wind energy projects for potential impacts on rare species, in addition to reporting rare plants and animals documented at the project site itself, NY Natural Heritage reports species of rare birds documented within 10 miles of the project site, and rare bats documented within 40 miles of the project site. These distances were determined in consultation with the NYSDEC Division of Fish, Wildlife and Marine Resources.

For information on NYSDEC's environmental review of proposed wind energy projects, and for the document Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects, please go to www.dec.ny.gov/energy/66494.html.

Birds within 10 miles

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS**
Bald Eagle *Breeding*	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N
Great Blue Heron *Breeding*	*Ardea herodias*	Protected Bird	S5
Sedge Wren *Breeding*	*Cistothorus platensis*	Threatened	S3B
Henslow's Sparrow *Breeding*	*Ammodramus henslowii*	Threatened	S3B
Northern Harrier *Breeding*	*Circus cyaneus*	Threatened	S3B,S3N
Red-headed Woodpecker *Breeding*	*Melanerpes erythrocephalus*	Special Concern	S2?B
Short-eared Owl *Nonbreeding*	*Asio flammeus*	Endangered	S2

* Conservation status in NYS as ranked by NY Natural Heritage Program on a 1 to 5 scale:
S1 = Critically imperiled
S2 = Imperiled
S3 = Rare or uncommon
S4 = Abundant and apparently secure
S5 = Demonstrably abundant and secure

B after one of the above ranks indicates the status rank is for breeding populations only.
N after one of the above ranks indicates the status rank is for nonbreeding wintering populations only.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

September 21, 2016

Patrick McCarthy
Fisher Associates
325 Delaware Avenue, Suite 200
Buffalo, NY 14202

Dear Mr. McCarthy:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the environmental assessment for the Ball Hill wind energy development, located in the Towns of Hanover and Villenova, Chautauqua County.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur on the project site or in its immediate vicinity. Also enclosed is a report of rare bats documented within 40 miles and rare birds documented within 10 miles of the project site, for use in assessing potential impacts of bird collisions. For information on NYSDEC's environmental review of proposed wind energy projects, and for the document *Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects*, please go to www.dec.ny.gov/energy/66494.html.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other resources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Nick Conrad

Nicholas B. Conrad
Information Resources Coordinator
NY Natural Heritage Program

The following state-listed animals have been documented in the vicinity of the Ball Hill wind energy project site.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed or are candidates for federal listing.

For information about potential impacts of your project on these populations, how to avoid, minimize, or mitigate any impacts, and any permit considerations, contact the Wildlife Manager or the Fisheries Manager at the NYSDEC Region 9 Office. A listing of Regional Offices is at http://www.dec.ny.gov/about/558.html.

The following species have been documented nesting at two locations within 0.6 mile of the project site, in the vicinity of Parcell Corners and of Walnut Creek.
Individual animals may be disturbed by activities up to 1 mile from their nests.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*FEDERAL LISTING*	
Birds				
Bald Eagle *Breeding*	*Haliaeetus leucocephalus*	Threatened		12661

This report only includes records from the NY Natural Heritage database. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.

The following rare plants, rare animals, and significant natural communities have been documented at your project site, or in its vicinity.

We recommend that potential onsite and offsite impacts of the proposed project on these species or communities be addressed as part of any environmental assessment or review conducted as part of the planning, permitting and approval process, such as reviews conducted under SEQR. Field surveys of the project site may be necessary to determine the status of a species at the site, particularly for sites that are currently undeveloped and may still contain suitable habitat. Final requirements of the project to avoid, minimize, or mitigate potential impacts are determined by the lead permitting agency or the government body approving the project.

The following significant natural communities are considered significant from a statewide perspective by the NY Natural Heritage Program. They are either occurrences of a community type that is rare in the state, or a high-quality example of a more common community type. By meeting specific, documented criteria, the NY Natural Heritage Program considers these community occurrences to have high ecological and conservation value.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*

Wetland/Aquatic Communities

Rich Hemlock-Hardwood Peat Swamp — High-Quality Occurrence of Rare Community Type

West Mud Lake Swamp: Excellent quality, with history of some selective logging followed by very good recovery. Community is well-buffered. Minimal disturbance and good size. 961

Shrub Swamp — High-Quality Occurrence

East Mud Lake: Of good size and biologically diverse, with some cottages on the lake shore. Uplands around the wetlands are primarily farm fields. There were no exotics observed. 3633

The following plants are listed as Endangered or Threatened by New York State, and/or are considered rare by the New York Natural Heritage Program, and so are a vulnerable natural resource of conservation concern.

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS*

Vascular Plants

Butterwort — *Pinguicula vulgaris* — Threatened — Imperiled in NYS

Walnut Creek Gorge, 1992-06-28: Wet shale cliffs that are verticle, sun-free, east-facing, and continuously wet. The substrate and soils probably have a calcareous component. 4618

This report only includes records from the NY Natural Heritage databases. For most sites, comprehensive field surveys have not been conducted, and we cannot provide a definitive statement as to the presence or absence of all rare or state-listed species. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the rare animals and plants in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org, from NatureServe Explorer at

www.natureserve.org/explorer, and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

Information about many of the natural community types in New York, including identification, dominant and characteristic vegetation, distribution, conservation, and management, is available online in Natural Heritage's Conservation Guides at www.guides.nynhp.org. For descriptions of all community types, go to www.dec.ny.gov/animals/97703.html for Ecological Communities of New York State.

The following rare animals have been documented in the general vicinity of the Ball Hill wind power project.

The impacts of wind turbines on animals include both impacts due to disturbance at the site of the turbines, and impacts due to flying birds and bats colliding with turbine blades. Therefore, when screening proposed wind energy projects for potential impacts on rare species, in addition to reporting rare plants and animals documented at the project site itself, NY Natural Heritage reports species of rare birds documented within 10 miles of the project site, and rare bats documented within 40 miles of the project site. These distances were determined in consultation with the NYSDEC Division of Fish, Wildlife and Marine Resources.

For information on NYSDEC's environmental review of proposed wind energy projects, and for the document Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects, please go to www.dec.ny.gov/energy/66494.html.

Bats within 40 miles

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS**
Northern Long-eared Bat *Non-winter location*	*Myotis septentrionalis*	Threatened *and Federally Listed as Threatened*	S1

Birds within 10 miles

COMMON NAME	*SCIENTIFIC NAME*	*NY STATE LISTING*	*HERITAGE CONSERVATION STATUS**
Bald Eagle *Breeding*	*Haliaeetus leucocephalus*	Threatened	S2S3B,S2N
Northern Harrier *Breeding*	*Circus cyaneus*	Threatened	S3B,S3N
Short-eared Owl *Nonbreeding*	*Asio flammeus*	Endangered	S2
Sedge Wren *Breeding*	*Cistothorus platensis*	Threatened	S3B
Henslow's Sparrow *Breeding*	*Ammodramus henslowii*	Threatened	S3B
Red-headed Woodpecker *Breeding*	*Melanerpes erythrocephalus*	Special Concern	S2?B
Great Blue Heron *Significant Breeding Colony*			S5

* Conservation status in NYS as ranked by NY Natural Heritage Program on a 1 to 5 scale:

S1 = Critically imperiled
S2 = Imperiled
S3 = Rare or uncommon
S4 = Abundant and apparently secure
S5 = Demonstrably abundant and secure

B after one of the above ranks indicates the status rank is for breeding populations only.
N after one of the above ranks indicates the status rank is for nonbreeding wintering populations only.

G-4 New York State Parks, Recreation, and Historic Preservation

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

November 02, 2016

Mr. Mark Lyons
Development Manager
Renewable Energy Systems Americas Inc.
455 Boston Post Road
Suite 206
Old Saybrook, CT 06475

Re: USACE
Ball Hill Wind Farm Project (29 Wind Turbines)
Towns of Villenova and Hanover, Chautauqua County
08PR01814

Dear Mr. Lyons:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the *Archaeological Survey for the Ball Hill Wind Project, Towns of Villenova and Hanover, Chautauqua County Addendum 3*, prepared by Panamerican Consultants and dated October 2016, in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources.

Based on this review, the SHPO concurs that the 2016 configuration of the Ball Hill Wind Farm Project is not sensitive for archaeological resources and that sufficient field investigations have been conducted, as per the NYSHPO *Guidelines for Wind Farm Development Cultural Resources Survey Work*. The SHPO does not recommend any further archaeological investigations for the current design of the Ball Hill Wind Project.

If you have any questions, I can be reached at (518) 268-2179.

Sincerely,

Nancy Herter

Nancy Herter
Archaeology Unit Program Coordinator
e-mail: nancy.herter parks.ny.gov

Kondak, Tegan

From: New York State Parks CRIS Application <cris.web@parks.ny.gov>
Sent: Tuesday, November 01, 2016 4:56 PM
To: rhanley@panamconsultants.com; Mark.Lyons@res-americas.com; Kondak, Tegan; christine@panamconsultants.com; Gibson, Robert; molly.a.connerton@usace.army.mil
Subject: SHPO Subsequent Submission Accepted for Project: 08PR01814

This message confirms that subsequent submission 8GJH3TNA4FXU has been accepted by the New York State Historic Preservation Office (SHPO) for project 08PR01814: Noble Ball Hill Wind Farm/94.5 MW/63 Turbines. Its new submission number is 08PR01814.018.

You may view information about this project and New York State's historic resources by visiting the Cultural Resource Information System (CRIS) at https://cris.parks.ny.gov. If you have any questions about CRIS, please contact CRIS Help at crishelp@parks.ny.gov. For any other questions, please call SHPO at 518-237-8643.

Sincerely,
New York State Historic Preservation Office

Please note that this email does NOT require any action on your part at this time. You are receiving this email as part of an online service recently launched by the New York State Office of Parks, Recreation and Historic Preservation's Division for Historic Preservation, also known as the New York State Historic Preservation Office (SHPO). This new Cultural Resource Information System (CRIS) is an advanced Geographic Information System program that provides access to New York State's vast historic and cultural resource databases and digitized paper records. In addition, the new system serves as an interactive portal for agencies, municipalities and the public who use or require consultation with our agency on historic preservation programs or issues.

Our email to you is in direct response to material that was submitted to our office regarding a project for which you were identified as a contact. Such projects include actions that are reviewable by our agency under the National Historic Preservation Act of 1966 (Section 106), the New York State Historic Preservation Act (Section 14.09 NYSPRHPL), or the State Environmental Quality Review Act (SEQRA).

If you did not enter this project directly into CRIS, you are receiving this notification as our office or another project contact has entered it into our system. You will receive future correspondence for this submission via email.

Kondak, Tegan

From: New York State Parks CRIS Application <cris.web@parks.ny.gov>
Sent: Tuesday, November 01, 2016 5:31 PM
To: rhanley@panamconsultants.com; Mark.Lyons@res-americas.com; Kondak, Tegan; christine@panamconsultants.com; Gibson, Robert; molly.a.connerton@usace.army.mil
Subject: SHPO Subsequent Submission Accepted for Project: 08PR01814

This message confirms that subsequent submission KV69PEPFR2MN has been accepted by the New York State Historic Preservation Office (SHPO) for project 08PR01814: Noble Ball Hill Wind Farm/94.5 MW/63 Turbines. Its new submission number is 08PR01814.019.

You may view information about this project and New York State's historic resources by visiting the Cultural Resource Information System (CRIS) at https://cris.parks.ny.gov. If you have any questions about CRIS, please contact CRIS Help at crishelp@parks.ny.gov. For any other questions, please call SHPO at 518-237-8643.

Sincerely,
New York State Historic Preservation Office

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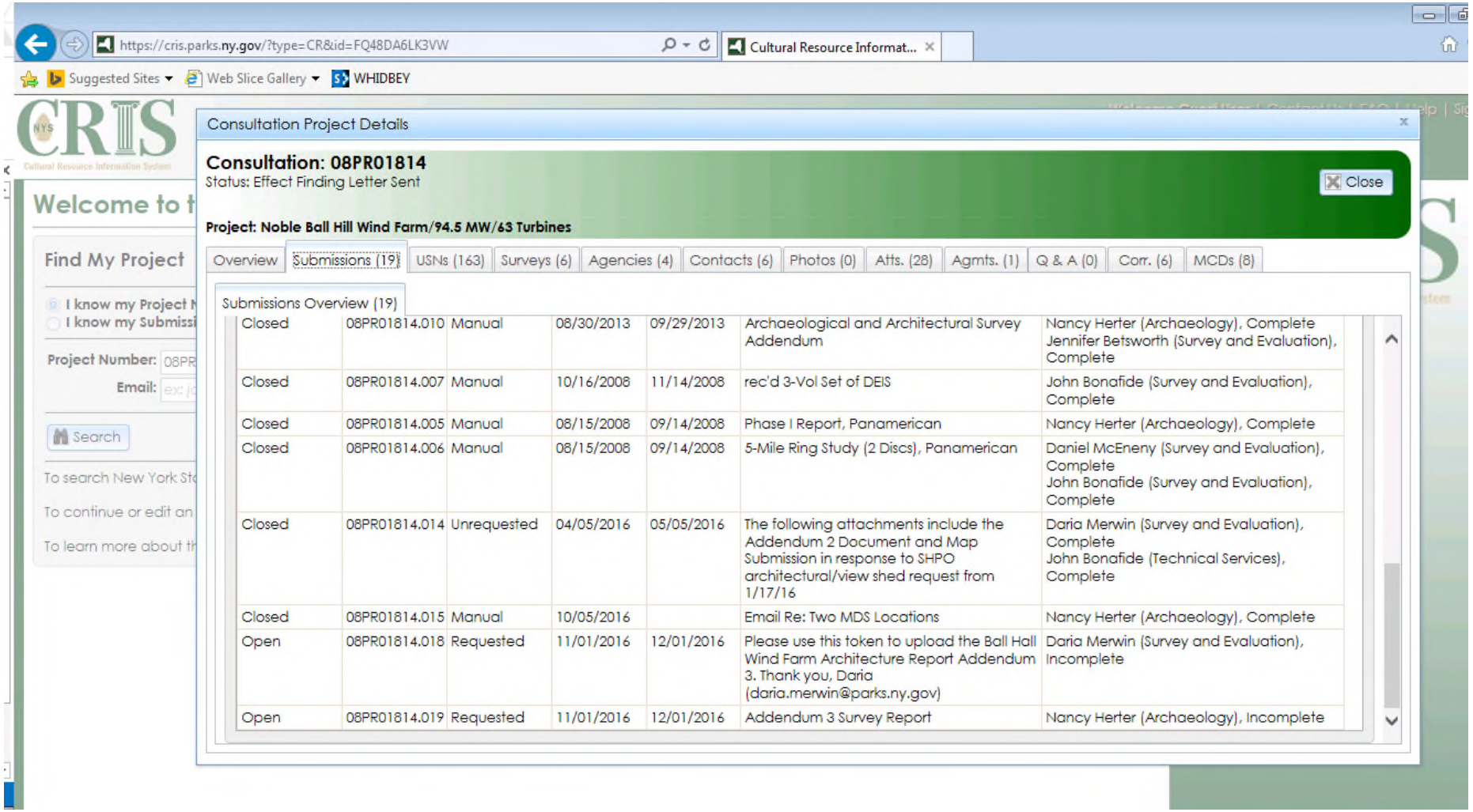
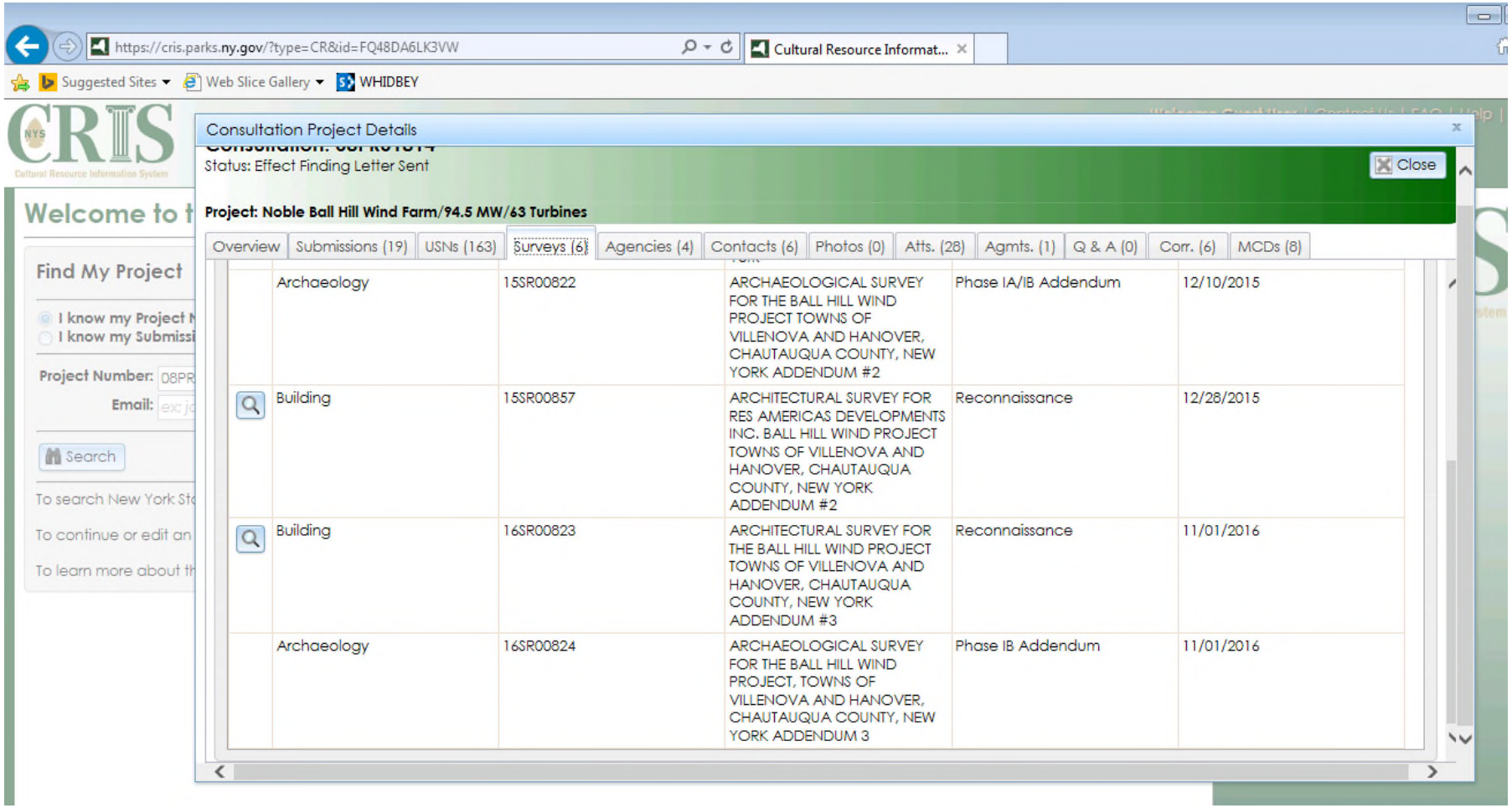
If you did not enter this project directly into CRIS, you are receiving this notification as our office or another project contact has entered it into our system. You will receive future correspondence for this submission via email.



Closed	08PR01814.010	Manual	08/30/2013	09/29/2013	Archaeological and Architectural Survey Addendum	Nancy Herter (Archaeology), Complete Jennifer Betsworth (Survey and Evaluation), Complete
Closed	08PR01814.007	Manual	10/16/2008	11/14/2008	rec'd 3-Vol Set of DEIS	John Bonafide (Survey and Evaluation), Complete
Closed	08PR01814.005	Manual	08/15/2008	09/14/2008	Phase I Report, Panamerican	Nancy Herter (Archaeology), Complete
Closed	08PR01814.006	Manual	08/15/2008	09/14/2008	5-Mile Ring Study (2 Discs), Panamerican	Daniel McEneny (Survey and Evaluation), Complete John Bonafide (Survey and Evaluation), Complete
Closed	08PR01814.014	Unrequested	04/05/2016	05/05/2016	The following attachments include the Addendum 2 Document and Map Submission in response to SHPO architectural/view shed request from 1/17/16	Daria Merwin (Survey and Evaluation), Complete John Bonafide (Technical Services), Complete
Closed	08PR01814.015	Manual	10/05/2016		Email Re: Two MDS Locations	Nancy Herter (Archaeology), Complete
Open	08PR01814.018	Requested	11/01/2016	12/01/2016	Please use this token to upload the Ball Hall Wind Farm Architecture Report Addendum 3. Thank you, Daria (daria.merwin@parks.ny.gov)	Daria Merwin (Survey and Evaluation), Incomplete
Open	08PR01814.019	Requested	11/01/2016	12/01/2016	Addendum 3 Survey Report	Nancy Herter (Archaeology), Incomplete



	Archaeology	15SR00822	ARCHAEOLOGICAL SURVEY FOR THE BALL HILL WIND PROJECT TOWNS OF VILLENOVA AND HANOVER, CHAUTAUQUA COUNTY, NEW YORK ADDENDUM #2	Phase IA/IB Addendum	12/10/2015
	Building	15SR00857	ARCHITECTURAL SURVEY FOR RES AMERICAS DEVELOPMENTS INC. BALL HILL WIND PROJECT TOWNS OF VILLENOVA AND HANOVER, CHAUTAUQUA COUNTY, NEW YORK ADDENDUM #2	Reconnaissance	12/28/2015
	Building	16SR00823	ARCHITECTURAL SURVEY FOR THE BALL HILL WIND PROJECT TOWNS OF VILLENOVA AND HANOVER, CHAUTAUQUA COUNTY, NEW YORK ADDENDUM #3	Reconnaissance	11/01/2016
	Archaeology	16SR00824	ARCHAEOLOGICAL SURVEY FOR THE BALL HILL WIND PROJECT, TOWNS OF VILLENOVA AND HANOVER, CHAUTAUQUA COUNTY, NEW YORK ADDENDUM 3	Phase IB Addendum	11/01/2016

NEW YORK STATE OF OPPORTUNITY. Parks, Recreation, and Historic Preservation

Resource Evaluation

Date: 05/02/2016

Staff: James Finelli

USN Number: 00954.000055

Name: Sears Farmhouse & Complex c.1920

Location: 8143 Oaks Road, Dayton NY

Resource Status:

1. **Determination:** Eligible
2. **Contributing:**

Criteria for Inclusion in the National Register:

A. [ ] Associated with events that have made a significant contribution to the broad patterns in our history.

B. [ ] Associated with the lives of persons significant in our past.

C. [X] Embodies the distinctive characteristics of a type, period or method of construction; or represents the work of a master; or posses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction.

D. [ ] Have yielded, or may be likely to yield information important in prehistory or history.

Summary Statement:

Meets Criterion C as a Sears farmhouse and complex.

NEW YORK STATE OF OPPORTUNITY. Parks, Recreation, and Historic Preservation

Resource Evaluation

Date: 05/02/2016

Staff: James Finelli

USN Number: 01326.000070

Name: Farm Complex c.1830

Location: 307 Phillips Road, Villenova NY

Resource Status:

1. **Determination:** Eligible
2. **Contributing:**

Criteria for Inclusion in the National Register:

A. [ ] Associated with events that have made a significant contribution to the broad patterns in our history.

B. [ ] Associated with the lives of persons significant in our past.

C. [X] Embodies the distinctive characteristics of a type, period or method of construction; or represents the work of a master; or posses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction.

D. [ ] Have yielded, or may be likely to yield information important in prehistory or history.

Summary Statement:

Meets Criterion C as a Greek Revival farmstead with barn and silo.

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

January 27, 2016

Mr. Mark Lyons
Development Manager
Renewable Energy Systems Americas Inc.
455 Boston Post Road, Suite 206
Old Saybrook, CT 06475

Re: USACE
Noble Ball Hill Wind Farm/94.5 MW/63 Turbines
08PR01814

Dear Mr. Lyons:

Thank you for continuing to consult with the New York State Historic Preservation Office (SHPO). We have reviewed the *Architectural Survey for the Ball Hill Wind Project, Towns of Villenova and Hanover, Chautauqua County, New York Addendum #2* prepared by Panamerican Consultants dated December 2015 in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

We note that the following properties inventoried in 2008 and 2013 studies were eliminated from the inventory of National Register eligible resources located within the visual Area of Potential Effect (APE) in the 2015 study (pages 2-2 through 2-16). Some of these omissions were due to mapping and National Register status errors in our new online database, the Cultural Resources Inventory System (CRIS). We have updated CRIS to correct these errors, and request that the Architectural Survey report, Addendum 2 be revised to include the following:

- The Silver Creek Historic District (USN 01346.000242), identified as National Register eligible in correspondence from this office dated September 30, 2013, has been tagged as eligible in CRIS

- The Center Street Historic District in Forestville (USN 01352.000127), identified as National Register eligible in correspondence from this office dated September 30, 2013, has been tagged as eligible in CRIS

- The Ewing Park South Dayton Historic District (USN 00954.000062), identified as National Register eligible in correspondence from this office dated September 24, 2008, has been tagged as eligible in CRIS

- Weaver Cemetery in Arkwright (USN 00926.000044) was not removed from CRIS at any time, and is now plotted on the CRIS map

- Ewing Park in South Dayton (USN 00954.000043) is now identified as contributing to the National Register eligible Ewing Park South Dayton Historic District; also, please note that USN 00954.000012 (the E.B. Crissey & Co. building at 30 Maple Street) was incorrectly tagged in CRIS as not National Register eligible, but it is eligible as a contributing property in the Ewing Park South Dayton Historic District

- St. Peter's Episcopal Church in Forestville (USN 01352.000002) was not removed from CRIS at any time, and was determined National Register eligible on September 5, 2013; it is now plotted on the CRIS map

In addition, thank you for noting the lack of GIS data and/or incorrect addresses for 12182 Markhams Road in Dayton, 11037 Alleghany Road in Hanover, 12010 and 12021 Angell Road in Hanover. These errors have been corrected, as has the undetermined status of the duplicate USN (01352.000003) for the National Register eligible Levi J. Pierce Homestead in Forestville.

We look forward to receiving the revised architectural survey report, and continuing our consultation. If further correspondence is required regarding this project, please be sure to refer to the Project Review (PR) number noted above. I can be reached at 518-268-2192 or by email (daria.merwin parks.ny.gov).

Sincerely,

Daria Merwin

Daria Merwin
Survey and Evaluation Unit

via email only

NEW YORK STATE OF OPPORTUNITY. | Parks, Recreation, and Historic Preservation

ANDREW M. CUOMO
Governor

ROSE HARVEY
Commissioner

January 07, 2016

Mr. Mark Lyons
Development Manager
Renewable Energy Systems Americas Inc.
455 Boston Post Road
Suite 206
Old Saybrook, CT 06475

Re: USACE
Noble Ball Hill Wind Farm/94.5 MW/63 Turbines
Multiple Locations
08PR01814

Dear Mr. Lyons:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). We have reviewed the *Addendum #2 Archaeological Survey for the Ball Hill Wind Project*, prepared by Panamerican Consultants and dated December 2015, in accordance with Section 106 of the National Historic Preservation Act of 1966. These comments are those of the SHPO and relate only to Historic/Cultural resources. They do not include other environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the National Environmental Policy Act and/or the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8).

Based on this review, the SHPO concurs that no additional Phase IB archaeological survey is warranted given that the Area of Potential Effects (APE) has been reduced by 46.2 acres and the low archaeological sensitivity of the 2015 Ball Hill Wind Project configuration.

If you have any questions, I can be reached at (518) 268-2179.

Sincerely,

Nancy Herter

Nancy Herter
Archeology Unit Program Coordinator
e-mail: nancy.herter parks.ny.gov via e-mail only

G-5 New York State Public Service Commission

RES America Developments Inc.
11101 W. 120th Avenue
Suite 400
Broomfield, CO 80021
Phone: 303 439 4200
Fax: 303 439 4299
Email: info@res-americas.com
Web: www.res-americas.com

November 22, 2016

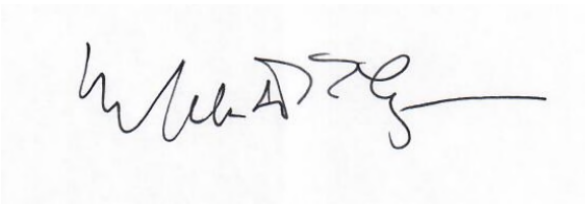
Mr. Andrew C. Davis
Utility Supervisor
New York State Department of Public Service
Three Empire State Plaza
Albany, New York 12223-1350
Re: SEQRA SDEIS Comments – Ball Hill Wind Energy, LLC

Dear Mr. Davis:

Ball Hill Wind Energy, LLC has reviewed your comments submitted on March 14 and 16, 2016 regarding the Supplemental Draft Environmental Impact Statement (SDEIS) for the Ball Hill Wind Project proposed for the Towns of Villenova and Hanover, New York.

We respectfully offer the attached responses. Please contact me at (860) 388-7730 with any questions or comments.

Sincerely,



Mark H. Lyons
Senior Manager, Project Development
RES America Developments Inc.
On behalf of Ball Hill Wind Energy, LLC.

Responses to
Comments of the New York State Department of Public Service
on Ball Hill Wind Project SDEIS

1. **The Comment noted that, as proposed in the SDEIS, a 5.8 mile long 230kv transmission facility would be subject to jurisdiction of the NYSPSC under Article VII of the Public Service Law.**

   Response: Since submitting the SDEIS for this project Ball Hill Wind Energy, LLC (Project Sponsor) has elected to revert to the original 115kv design of its transmission facility. As currently proposed, the approximately 5.7 mile long transmission line would follow the same route as the 230kv line described in the SDEIS. As a 115kv facility less than 10 miles in length the currently proposed transmission line would not be subject to Article VII jurisdiction.

2. **Comment regarding Article VII jurisdiction.**

   Response: Please see Response to Comment 1, above.

3. **Comment regarding Article VII jurisdiction.**

   Response: Please see Response to Comment 1, above.

4. **Comment: DPS recommends that trenching machines not cross significantly classed streams (including classes C(T) and above and any intermediate waterbodies greater than 10 feet). Instead, during dam and pump around or similar installation methods, proper erosion control devices should be placed along the stream bank; the trench can then be excavated from either side of the control measures.**

   Response: Underground collection lines would be installed via trenching or using a directional bore at stream crossings. Boring (and not dam and pump methods) will occur for stream crossings where required by permit condition or where specific site conditions (e.g. protected streams, steep slopes, unstable soils or other engineering challenges) necessitate its use. If directional bore is used, a horizontal boring machine will install a bore sufficiently below the bed, and cables will be pulled back in the bore. Each bore will start and finish beyond stream banks. Aboveground junction boxes will

be located at various locations to join multiple reels of cables for long runs and at one end of each directional bore location.

5. **It would appear that there would be a potential for reduction in environmental impact (including reduction in forest clearing, land use, visible exposure, etc.) if the new collection substation were to be constructed north of its currently proposed location. By placing the substation in a more northerly location, the length of the overhead transmission facility and ROW area would be reduced. The FEIS should explain whether any alternative locations for the collection substation were explored, whether any reasonable alternatives were identified, and provide a comparison of potential impacts.**

   Response: Since receipt of this Comment, the proposed new collection substation has been moved to the north of its earlier proposed location. This open field location also satisfies landowner preferences.

6. **Comment: Please provide an explanation of the term "match marking" with regard to the proposed staging area.**

   Response: Match-marking is the process of marking equipment components so they can be assembled in the correct manner.

7. **Comment: If available, provide a map of the potential collection line locations that may be installed overhead; an accompanying explanation would also be beneficial. Also, if available, provide the required clearing ROW width for installation of overhead collection lines.**

   Response: No overhead collection line circuits are currently proposed for the Project.

8. **Comment: DPS remains concerned that the proposed location of the 230kv line involves clearing and access road development on steep slopes and construction of transmission structures close to protected streams. The SDEIS does not provide any updated Transmission Line Plan and Profile Drawings reflecting the upgrade of design from 115kv to 230kv (DEIS Drawings BH-T-301 Sheets 1 through 6 were for a 115kv facility). Final facility design and location will be subject to the NYS PSC review pursuant to PSL Article VII.**

Response: As mentioned previously, the concerns of DPS have been reviewed and the proposed transmission line would be 115kv, not 230kv. Its constructability has been reviewed by RES engineers. Typical Transmission Line Plan and Profile Drawings are attached as Appendix B (also included in Appendix C of the FEIS).Further analysis of the potential environmental impacts of the proposed 115kv line are presented in the FEIS in Section 1.4

NOISE

9. **Comment: In comments on the DEIS submitted in November 2008, DPS identified the need to assess tonal noise from transmission grade transformers. The SDEIS does not provide analysis of potential for tones from the substation. The substation analysis is based on "one MVA, 120kv utility scale transformer" rather than a 230kv transformer as now proposed for the Ball Hill Project. Furthermore, DPS considers that the sound power level estimates for the transformer need supporting information either by supplementing their derivation or by documenting with sound tests. Given the proximity of the 50 dBA noise contour line the likelihood of occurrence of a prominent tone should be analyzed as well as the potential to exceed local law limits or cause annoyance or complaints at closer noise sensitive receptors.**

   Response: Appendix A, attached hereto, includes detailed responses to DPS comments on tonal noise from transmission grade transformers.

VISUAL

10. **Comment: The FEIS should provide appropriate representations and descriptions of proposed facilities so that appropriate characterization and consideration of cumulative impacts of the Ball Hill Wind project and associated major electric transmission facility is documented.**

    Response: As mentioned previously, the concerns of DPS have been reviewed and the proposed transmission line would be 115kv, not 230kv. Its constructability has been reviewed by RES engineers. Typical Transmission Line Plan and Profile Drawings are included in Appendix B of this letter (and Appendix C, Project Drawings in this FEIS). Cumulative impacts from this Project, its associated transmission facilities and other wind projects including their associated transmission facilities in the region are analyzed in the FEIS as Section 1.4.16.

11. **Comments: DPS repeats its recommendations (regarding substation lighting design): fixtures should be specified as full-cutoff with no drop-down optics. Task lighting**

should be controlled by manual switches to allow workers to light areas appropriate as needed to accomplish tasks. Manufacturers' cut sheets should be provided, which specify lighting illuminance levels and pattern, and which list features as discussed above regarding light cutoff, shields, and optic criteria.

Response: During construction and operation, lighting at the substation and O&M facility will consist of manually activated full-cutoff exterior lighting and temporary work lighting, with no drop down optics. During normal operations the substation will not be lit except as required for site security and/or as required by federal, state, or local agencies. Routine maintenance work at the substation is expected to occur during daylight hours; however nighttime work (requiring lighting) may be required in an emergency or for reliability reasons. Manufacturer cut sheets are not available at this time, as a specific manufacturer has not yet been chosen.

CUMULATIVE IMPACTS

12. In consideration of cumulative estimates of bird and bat fatalities, the SDEIS refers to the Cassadaga Wind project as proposing "70" turbines. DPS suggests that the calculation of total cumulative fatalities of birds and bats be reviewed based on the current proposal for the Cassadaga Wind facility…"up to 62 wind turbines".

Response: This change has been made. Cumulative visual impacts of the Ball Hill Wind Project, and the proposed Arkwright Summit and Cassadaga Wind Projects (up to 62 turbines) are described, illustrated and discussed in the Ball Hill Wind Project Final Visual Resource Assessment, beginning at page 54 (attached to the FEIS as Appendix I). In addition an updated cumulative impact analysis is included in the FEIS as Section 1.4.16.

Appendix A: Responses to Noise Comments

November 16, 2016 Epsilon Ref. 4366

PRINCIPALS

Theodore A Barten, PE
Margaret B Briggs
Michael E Guski, CCM
Dale T Raczynski, PE
Cindy Schlessinger
Lester B Smith, Jr
Robert D O'Neal, CCM, INCE
Andrew D Magee
Michael D Howard, PWS
Douglas J Kelleher
AJ Jablonowski, PE
Stephen H Slocomb, PE
David E Hewett, LEED AP

Samuel G. Mygatt, LLB
1943-2010

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978 897 7100
FAX **978 897 0099**

Mr. Mark H. Lyons
Senior Project Development Manager
Renewable Energy Systems Americas Inc.
11101 West 120th Avenue, Suite 400
Broomfield, CO 80021

Subject: Response to SDEIS Comments – NYS DPS letter, March 14, 2016
Ball Hill Wind Project

Dear Mark:

As per your request, Epsilon Associates, Inc. (Epsilon) is pleased to provide these responses to the noise-related comments of the NY State Department of Public Service (DPS). The DPS comments are contained in a letter dated March 14, 2016 and focused on the Supplemental Draft Environmental Impact Statement (SDEIS) for the proposed Ball Hill Wind Project in Chautauqua County, New York.

The responses are organized according to the 12 questions and/or comments found in Appendix A of the March 14 letter.

Comment 1: Section 6.1.3 includes sound power levels (dBA) for one MVA, 120 kV utility transformer with 5 dB noise reduction by octave band: Confirm whether electrical power for the proposed transformer is 1 MVA. Explain if sound emissions for 240 kV transformer are expected to be different than those estimated for a 120 kV transformer.

Response 1: There was a typographical error in footnote 1 to Table 6-7 (page 6-3) in Appendix O of the SDEIS. It should have read:

> "Based on standard NEMA TR.1 Table 0-1 for one 154 MVA, 120 kV utility scale transformer with 5 dB noise reduction by octave band."

Since the sound level study for the SDEIS was submitted in the fall of 2015, additional design and capacity information has been developed for the project.

Thus the 154 MVA rating has been updated. A 5.7 mile 115kV transmission line will connect the wind turbines to the electrical grid. This transmission line will have a substation at either end. The interconnection substation at the northern end of the transmission line ("northern substation") will have one 230 MVA transformer, while the collection substation ("southern substation") will have one 120 MVA transformer.

Initial sound power level calculations were made for each transformer using the methodology described in Section 4.2.5 of the Edison Electric Institute's (EEI) "Electric Power Plant Environmental Noise Guide (Volume I, 2nd Ed., 1984). Sound levels for the 230 MVA transformer are 2 dB lower than estimated by the EEI method. This reduction will be achieved by either specifying quieter equipment or installation of a sound wall.

Comment 2: Section 6.1.3 includes sound power levels (dBA) for one MVA, 120 kV utility transformer with 5 dB noise reduction by octave band: Provide version and year of publication of NEMA Standard used for sound power determination. Specify if the standard corresponds to the most recent version.

Response 2: As noted in Response 1 above, the methodology used to calculate sound power from the transformers as taken from EEI Electric Power Plant Environmental Noise Guide. However, that methodology is based on the NEMA sound level ratings procedure.

For example, Table 1 of the NEMA standard NEMA TR 1-2013 "Transformers, Step Voltage Regulators and Reactors" contains sound level data for power transformers. According to this table, a transformer with secondary cooling (worst-case for sound levels) will have a sound pressure level at 1 foot from the reference surface of 80 dBA (120 MVA) and 83 dBA (230 MVA). These are identical to the ratings using the EEI Guide technique. The 2013 version of NEMA TR 1 is the most recent version available.

Comment 3: Section 6.1.3 includes sound power levels (dBA) for one MVA, 120 kV utility transformer with 5 dB noise reduction by octave band: Provide estimated NEMA rating for proposed transformer.

Response 3: As noted in Response 1 above, the NEMA rating for the interconnection substation transformer is 230 MVA, and the NEMA rating for the collection substation transformer is 120 MVA.

Comment 4: Section 6.1.3 includes sound power levels (dBA) for one MVA, 120 kV utility transformer with 5 dB noise reduction by octave band: Provide justification for the 5 dB noise reduction at all octave bands.

Response 4: The sound level data proposed for the 154 MVA transformer in the fall of 2015 is no longer applicable. Therefore, the 5 dB noise reduction at all octave bands is no longer relevant.

Comment 5: Section 6.1.3 includes sound power levels (dBA) for one MVA, 120 kV utility transformer with 5 dB noise reduction by octave band: Provide estimated dimensions and envelope area applicable to sound power estimates, if available.

Response 5: The methodology in the EEI Guide provides a technique to convert NEMA sound pressure levels to sound power levels based only on the MVA rating. No dimensional information about the transformer is thus required. This is the methodology used for the Ball Hill Wind project.

Comment 6: Section 6.1.3 includes sound power levels (dBA) for one MVA, 120 kV utility transformer with 5 dB noise reduction by octave band: Provide clear derivation of sound power levels estimates or alternatively provide sound test including Sound Power Levels for proposed transformer from the Manufacturer.

Response 6: According to RES, each and every transformer is a custom build, so there are no cut sheets available for them. Sound power levels are not something that is shown on any cut sheets. The project will specify what the permissible sound levels are and then the suppliers will design a transformer accordingly. Once the unit is built, it will be tested for sound. This is done by measuring the one-third octave band sound pressure levels, and from the sound pressure and the physical size of the transformer, calculate the sound power levels. Note that this will only be done once a unit is purchased, designed, constructed, and tested, so no details in this regard are available at this stage in permitting. However, the unit will be specified to achieve a result of "not tonal."

A derivation of the sound power levels used in the latest sound study report[1] are shown below as described in Table 4.5 of the EEI Guide. For a standard transformer:

$$\text{NEMA sound rating} \sim 55 + 12 \log \text{MVA (dBA)}$$

The A-weighted sound power level L_w is:

$$L_w = \text{NEMA sound rating} + 10 \log S$$

Where

$$10 \log S = 14 + 2.5 \log \text{MVA}$$

The following adjustments are made to the NEMA sound rating for the nine standard octave bands:

Hz	31	63	125	250	500	1000	2000	4000	8000
dB	-3	+3	+5	0	0	-6	-11	-16	-23

Sound power calculations for the 120 MVA transformer are presented in Table 6-1a and 6-1b:

1 Sound Level Assessment Report, Ball Hill Wind Project, prepared for Renewable Energy Systems Americas, Inc. by Epsilon Associates, Inc., August 30, 2016, revised October 4, 2016.

Table 6-1a 120 MVA Transformer Sound Power Levels (dBA)

MVA Rating	120	MVA	
NEMA Sound Rating	80	dBA	NEMA = 55 + 12xLog10(MVA)
10xLog(S)	19.2	dBA	10xLog(S) = 14 + 2.5xLog(MVA)
L_w	99.1	dBA	Lw = NEMA + 10xLog(S)

Table 6-1b 120 MVA Transformer Sound Power Levels

Octave Band (Hz)	Overall	31.5	63	125	250	500	1k	2k	4k	8k
EEI corrections (dB)		-3	3	5	0	0	-6	-11	-16	-23
L_w spectrum *(dB)	108.2	96	102	104	99	99	93	88	83	76
A-wt correction		-39.4	-26.2	-16.1	-8.6	-3.2	0	1.2	1	-1.1
L_w spectrum (dBA)	99.5	57	76	88	91	96	93	89	84	75

Sound power calculations for the 230 MVA transformer are presented in Table 6-2a and 6-2b:

Table 6-2a 230 MVA Transformer Sound Power Levels (dBA)

MVA Rating	230	MVA	
NEMA Sound Rating	83	dBA	NEMA = 55 + 12xLog10(MVA)
10xLog(S)	19.9	dBA	10xLog(S) = 14 + 2.5xLog(MVA)
L_w	103.2	dBA	Lw = NEMA + 10xLog(S)

Table 6-2b 230 MVA Transformer Sound Power Levels

Octave Band (Hz)	Overall	31.5	63	125	250	500	1k	2k	4k	8k
EEI corrections (dB)		-3	3	5	0	0	-6	-11	-16	-23
L_w spectrum *(dB)	112.3	100	106	108	103	103	97	92	87	80
A-wt correction		-39.4	-26.2	-16.1	-8.6	-3.2	0	1.2	1	-1.1
L_w spectrum (dBA)	103.6	61	80	92	95	100	97	93	88	79

Comment 7: Sound Level Assessment Report doesn't include an evaluation of tonality for proposed substation noise sources: Provide full text of local laws and any section applicable to noise emissions from the substation including any noise reductions to be applied on any noise limits should a tone, as defined by local regulation, be present.

Response 7: The Town of Hanover, Article XVI Wind Energy Conversion Systems (WECS),Section 1606 "Zoning District and Bulk Requirements", subparagraphs 3 through 6, contain applicable noise emission limits. Subparagraph 4 has text applicable to a tone:

> "In the event audible noise due to WECS operations contains a steady pure tone, such as a whine, screech, or hum, the standards for audible noise set forth in subparagraph 3 of this subsection shall be reduced by 5 dBA. A pure tone is defined to exist if the 1/3 octave band sound pressure level in the band, including the tone, exceeds the arithmetic average of the sound pressure levels of the two contiguous 1/3 octave bands by 5 dBA for center frequencies of 500 Hz and above, by 8 dBA for center frequencies between 160 Hz and 400 Hz, or by 15 dBA for center frequencies less than or equal to 125 Hz."

Section 690.12 (Setbacks for Wind Energy Conversion Systems), Parts A through D of Local Law No. 1 of 2007 for the Town of Villenova contains identical language to the Town of Hanover for a tone (section 690.12.B).

The full text of the local laws applicable to WECS in each town, are found in Attachments A and B, respectively, appended hereto.

Comment 8: Sound Level Assessment Report doesn't include an evaluation of tonality for proposed substation noise sources: Report measured fractional band ambient noise levels (L90) in the vicinity of proposed substation.

Response 8: Existing condition sound level data were measured at six locations around the site from March 26 to April 8, 2008.[2] No fractional band sound level data were measured for this program. In any event, it is not critical to know the current fractional bands around the proposed substation sites since the transformers will be designed to not be tonal in nature.

Comment 9: Sound Level Assessment Report doesn't include an evaluation of tonality for proposed substation noise sources: Provide assessment of tonality at the most potentially impacted noise sensitive receptors. Specify if prominent tones are expected to be present at those locations.

Response 9: As described in Response 6 above, each and every transformer is a custom build. The project will specify what the permissible sound levels are and

2 Environmental Sound Survey and Noise Impact Assessment, Noble Ball Hill Windpark, prepared for Noble Environmental Power by Hessler Associates, Inc. July 16, 2008.

then the suppliers will design a transformer accordingly. Therefore, no one-third octave band sound level data are available for the transformers proposed for Ball Hill wind.

Comment 10: Figures 6-1 and 6-2 show the 50 dBA noise contour line very close to adjacent noise sensitive receptors: Provide expanded figures to show in better detail, proposed noise sources within the substation site, site property boundaries, and adjacent noise sensitive receptors.

Response 10: The attached Figure 10-1A and Figure 10-1B are zoomed-in from Figure 6-1 in the most recent sound level assessment report cited earlier in this response (rev. October 4, 2016). Figure 10-1A is the interconnection substation located at the northern edge of the Wind Overlay District, and Figure 10-1B is the collection substation located in the center of the project north of Hurlbert Road.

Comment 11: Figures 6-1 and 6-2 show the 50 dBA noise contour line very close to adjacent noise sensitive receptors: Specify any increase in ambient levels based upon existing L90 ambient noise levels and forecasted ambient levels from the substation at the most impacted sound sensitive receptors including and excluding noise levels from the closest proposed wind turbines.

Response 11: The nearest ambient sound level monitor to the collection substation was "Monitor 5" located near #9830 Dye Road just south of the Villanova/Hanover town line. "Monitor 5" is approximately 1.25 miles from the substation transformer. As seen in Figure 2.5.1 in the July 16, 2008 monitoring study ("Hessler Report"), the existing L90 ambient sound level is not a single number but varied by more than 30 dBA (~25 dBA to ~58 dBA) over the course of two weeks. For worst-case sound level impacts from the wind farm, wind speeds will be at 7 m/s at 10 meter reference height (10 m/s at hub height of 87 meters AGL). The existing L90 ambient at a 7m/s wind speed in the area is 34 dBA (Table 2.7.1 in Hessler Report).

Table 11-1 below summarizes the most impacted sensitive receptors around the collection substation as shown in Figure 10-1B, with and without contributions from the wind turbines. The nearest receptor to the transformer is ID #106 at 1660 feet. It should be pointed out that comparing a project Leq sound level to an ambient L90 sound level is not reasonable. As discussed in the October 4, 2016 sound study, the Leq background for a 7 m/s case is 44 dBA, or 10 dBA higher than the L90.

Table 11-1 Collection Substation Sound Levels (dBA)

Receptor ID	Existing L90 Ambient (dBA)	Project only (Wind Turbines + Substation) (Leq, dBA)	Substation only (Leq, dBA)
106	34	44	34
105	34	44	32
10	34	42	32
103	34	42	30
104	34	43	28
219	34	43	25
218	34	43	25
217	34	43	24

There was no ambient sound level monitor near the interconnection substation. However, the NY State Thruway (Interstate 90) is less than 1,200 feet away from the nearest residence. With an average daily traffic of 25,000 vehicles on this section of I-90, the L90 ambient sound levels will be significantly higher than those measured within the wind farm as reported in Table 11-1 above. The project sound levels modeled at all residences near the interconnection substation are due exclusively to the transformer.

Comment 12: Figures 6-1 and 6-2 show the 50 dBA noise contour line very close to adjacent noise sensitive receptors: Estimate potential for annoyance and complaints from noise emissions at the closest noise sensitive receptors including any corrections for tonality, if applicable. Briefly explain and provide justification for the use of selected methodology for assessment of community noise reaction.

Response 12: The Modified Composite Noise Rating (CNR) methodology will be used to estimate the potential for annoyance and complaints from the project at the closest sensitive receptors. The Modified CNR method is a widely-accepted, published procedure using a set of curves to rate the annoyance of outdoor noise.[3] It has also been used in NYS for evaluation of sound level impacts, particularly from power projects over the years.

3 Electric Power Plant Environmental Noise Guide, Volume I, Edison Electric Institute, prepared by Bolt, Beranek and Newman, Inc., revised 1984.

The basic premise is that octave band sound levels at a noise-sensitive receptor from the project of interest are plotted on a graph of noise level rank curves. The curves are labeled "a" to "m" and the noise level rank is given by the highest area into which the measured spectrum protrudes in any octave band. Corrections, or adjustments, are then applied to the noise level rank to obtain the CNR rating. These corrections take into account background noise, temporal and spectral character of the sound, and any previous exposure of the community to this type of noise. The CNR is then evaluated against a graph to obtain the "average expected response from a normal community."

A Modified CNR evaluation was done for the two highest sound levels in the sound study. The first is receptor ID #177 which is located on Ball Hill Road northeast of turbine T15. Sound levels at this location are exclusively from the wind turbines with no contribution from the substations. The second location is receptor ID #376 which is located on Bennett State Road due west of the interconnection substation. Sound levels at this location are exclusively from the interconnection substation with no contribution from the wind turbines.

Figures 12-1 and 12-2 display the noise level rank of receptor IDs #177 and #376 respectively. These ranks are "e" and "d" respectively. Although actual octave band background L90 data are not available, the technique in Table 2-4 of the Hoover & Keith "Noise Control for Buildings and Manufacturing Plants" contains a discussion of the Modified CNR method, and provides an estimated background correction based on general land-use and vehicular traffic in the area. Receptor #176 is within 300 feet of an intermittent light traffic road, while receptor #376 is within 1200 feet of the NY State Thruway (I-90). The character (tonality) of the sound from the substation at #376 was assumed to be "not tonal" as per the response to question 6 above. In regard to step 5 "previous exposure/attitude", the area around #177 is largely agricultural and thus has been subject to farm machinery noise for many years, the local farmers are supportive of the project, and there are many operating wind turbines in the vicinity of these towns so they are not completely unique. The area around #376 does not have an existing substation so it was corrected for "no prior exposure" to this type of source.

Table 12-1 summarizes the noise rank and adjustments at each location. The results of this analysis show that receptors along Ball Hill Road (ID #177) will have a CNR of "D" and thus have "sporadic complaints." The residence near the interconnection substation (#376) will have a CNR of "C" and thus be between "No reaction, though noise is generally noticeable" and "sporadic complaints."

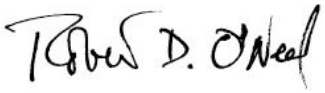
Table 12-1 Modified CNR Adjustments

Step No.	Aspect	Rank or Correction ID #177	Rank or Correction ID #376
1	Source sound level	e	d
2	Background	0	-1
3a	Time of day	0	0
3b	Seasonality	0	0
3c	Intermittency	0	0
4	Character of sound	0	0
5	Previous exposure/attitude	-1	0
6	Composite Noise Rating	D	C

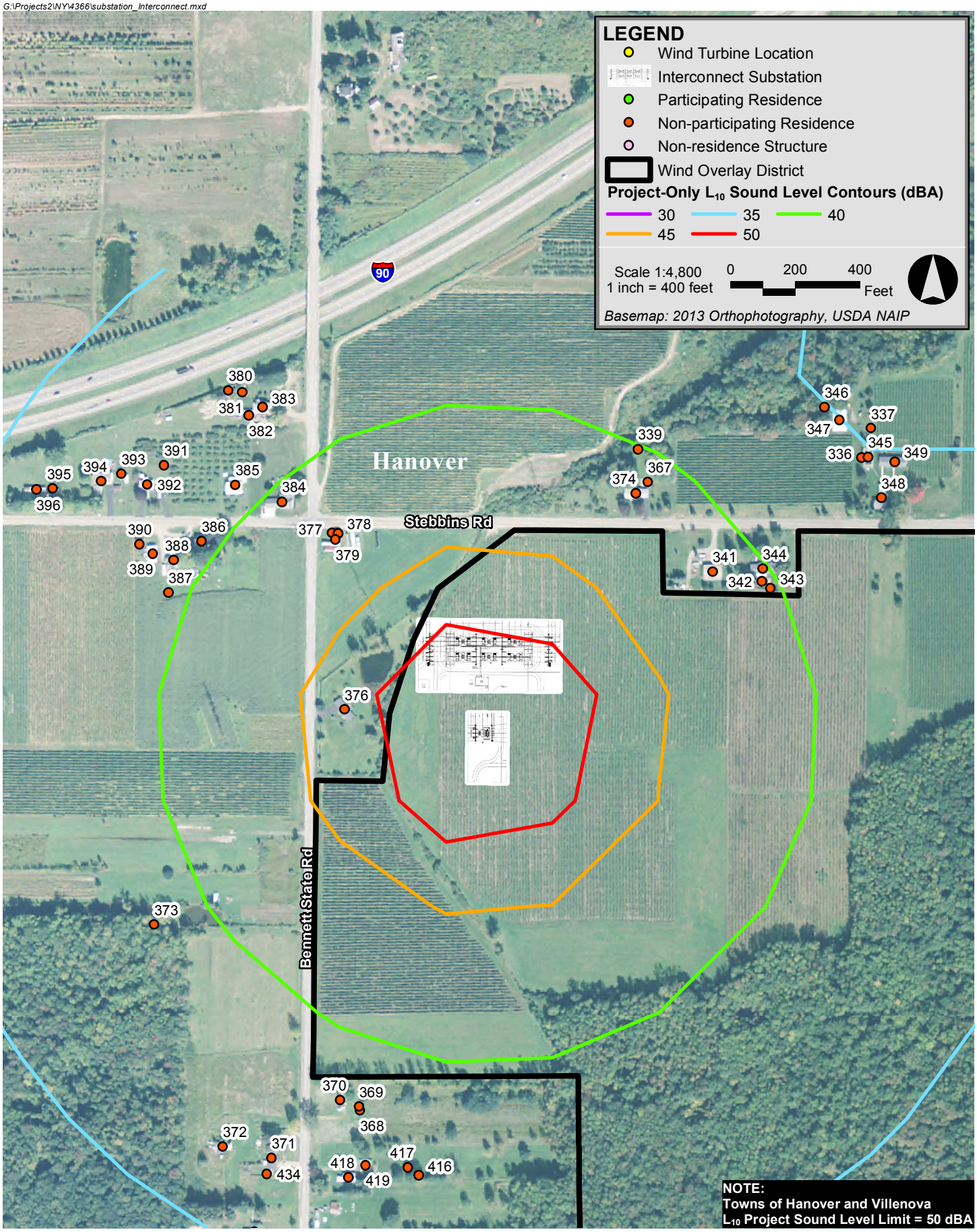
If you have any questions on this matter, please feel free to call me at (978) 461-6236, or e-mail me at roneal@epsilonassociates.com.

Sincerely,

EPSILON ASSOCIATES, INC.



Robert D. O'Neal, CCM, INCE Bd. Cert.
Principal

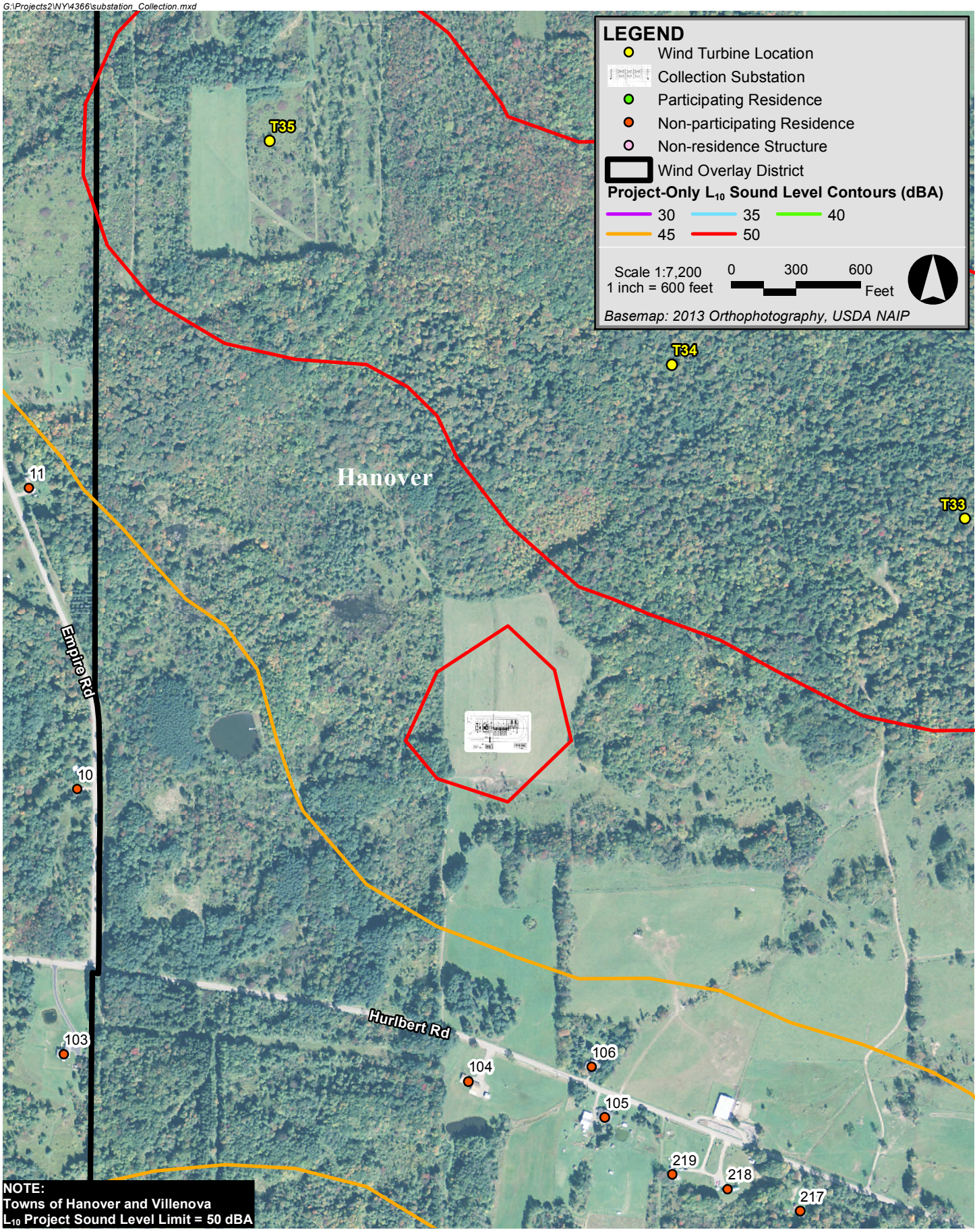


Ball Hill Wind Project Hanover & Villenova, New York

Epsilon ASSOCIATES INC.

Figure 10-1A: Interconnect Substation

Maximum Project-Only L_{10} Sound Levels
Vestas V126-3.45 MW (11m/s at 87m HH)



Ball Hill Wind Project Hanover & Villenova, New York

Epsilon ASSOCIATES INC.

Figure 10-1B: Collection Substation

Maximum Project-Only L_{10} Sound Levels
Vestas V126-3.45 MW (11m/s at 87m HH)

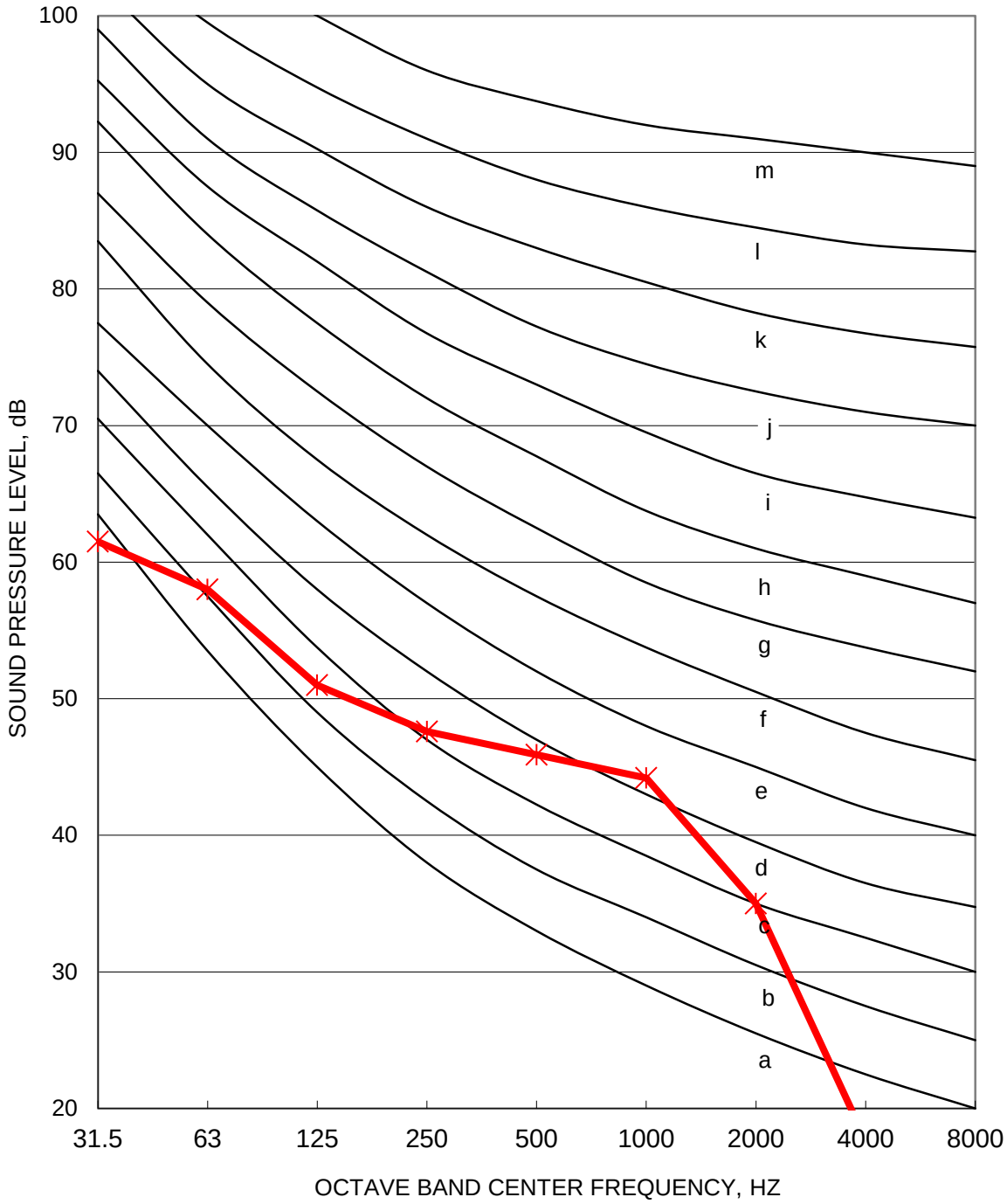


Figure 12-1. Noise Level Rank Curves for Modified CNR Rating Sytem -- Receptor 177

The modeled octave band sound pressure levels of the noise to be evaluated are plotted on the grid. The highest zone into which the spectrum protrudes is designated as the noise level rank.

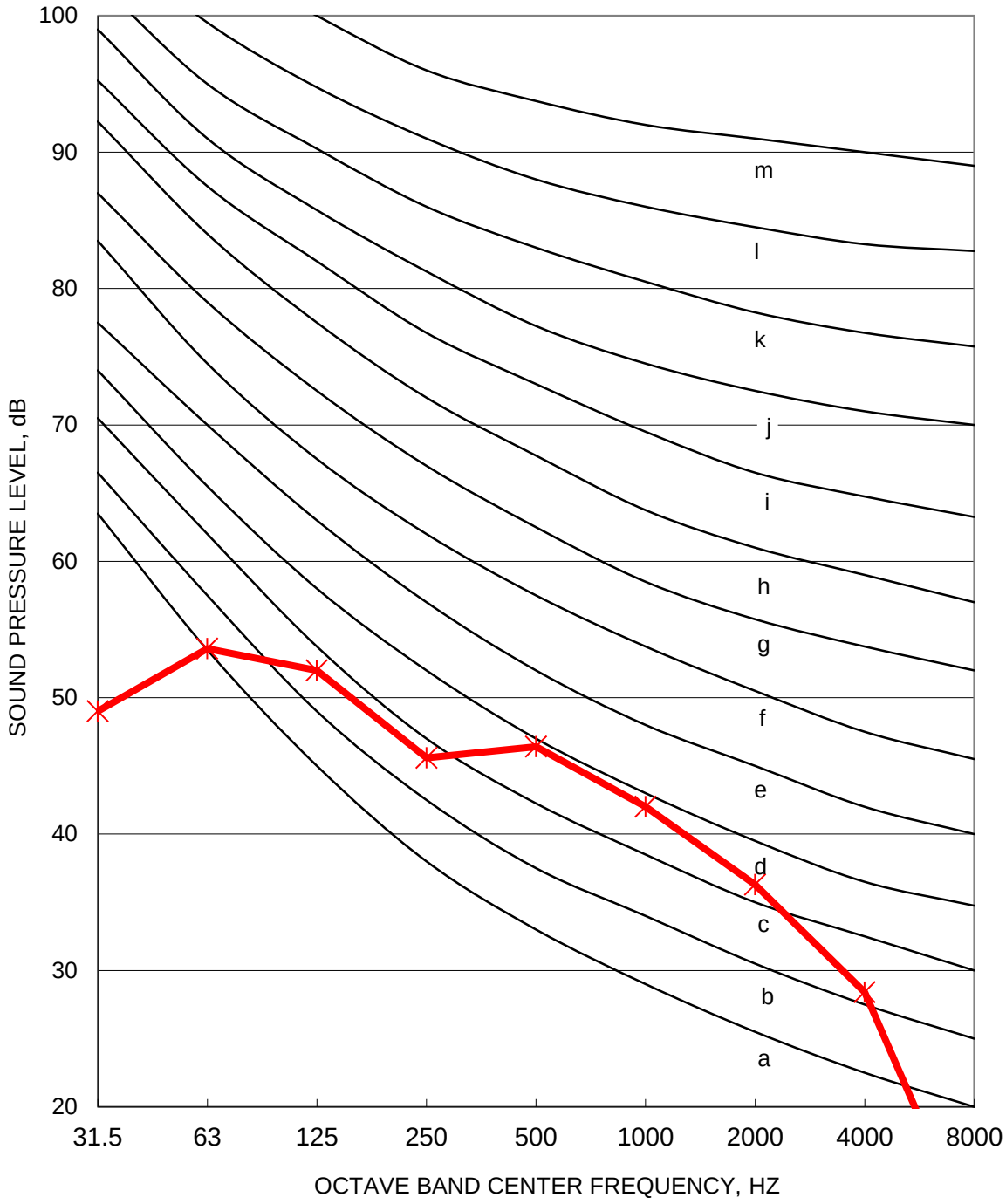


Figure 12-2. Noise Level Rank Curves for Modified CNR Rating Sytem -- Receptor 376

The modeled octave band sound pressure levels of the noise to be evaluated are plotted on the grid. The highest zone into which the spectrum protrudes is designated as the noise level rank.

Town of Hanover

Article XVI

Wind Energy Conversion Systems: (WECS)

SECTION 1601 - Legislative-Intent

The **Town of Hanover** recognizes the increased demand for converting wind energy into electrical energy. The intent of this local law is to regulate wind energy **(WECS)** in the **Town of Hanover.** The intent of this local law is to accommodate the necessary infrastructure for the provision of utility scale and Small **WECS** wind-powered electricity generation in facilities so that they may be developed in a manner hereby deemed to be compatible with the general health, welfare and safety of the residents of the **Town of Hanover.** Furthermore, to address the visual, aesthetic and land use compatibility aspects of wind energy conversion systems. **(WECS)**

SECTION 1601 .1- Authority

The Town Board of the Town of Hanover enacts this Local Law under the authority granted by:

1. Article IX of the New York State Constitution, § 2(c)(6) and (10).

2. New York Statute of Local Governments, § 10(1) and (7).

3. New York Municipal Home Rule Law, § 10(1)(i) and (ii) and § 10(1)(a)(6), (11),(12), and (14).

4. New York Town Law § 130(1)(Building Code), (3)(Electrical Code), (5)(Fire Prevention), (7)(Use of streets and highways), (7-a)(Location of Driveways), (11)(Peace, good order and safety), (15)(Promotion of public welfare), (15-a)(Excavated Lands), (16)(Unsafe buildings), (19)(Trespass), and (25)(Building lines).

5. New York Town Law § 64(17-a)(protection of aesthetic interests) and (23)(General powers).

SECTION 1602 - Definitions

Accessory, Facility, or Equipment: Any structure other than a **WECS**, related to the use and purpose of deriving energy from such towers, located at the tower facility.

Agricultural Or Farm Operations: means the land and on-farm buildings, equipment, manure processing and handling facilities, and practices which contribute to the production, preparation, and marketing of crops, livestock, and livestock products as a utility scale enterprise, including a "utility scale horse boarding operation" as defined in subdivision thirteen of New York Agriculture and Markets Law § 301 and "timber processing," as defined in subdivision fourteen of New York Agriculture and Markets

Law § 301. Such farm operation may consist of one or more parcels of owned or rented land, which parcels may be contiguous or noncontiguous to each other.

EAF: Environmental Assessment Form used in the implementation of the SEQRA as that term is defined in Part 617 of Title 6 of the New York Codes, Rules and Regulations.

EIS: Environmental Impact Statement used in the implementation of the SEQRA as that term is defined in Part 617 of Title 6 of the New York Codes, Rules and Regulations.

Nacelle: The portion of the wind turbine that connects the rotor to the support tower and houses the generator, gearbox, drive train and braking system.

Residence: Shall mean any dwelling suitable for habitation existing in the Town of Hanover on the date an application is received including seasonal homes, hotels, hospitals, motels, dormitories, sanitariums, nursing homes, senior housing, schools or other buildings used for educational purposes. A residence may be part of a multi-dwelling or multi-purpose building, but shall not include correctional institutions.

SEQRA: The New York State Environmental Quality Review Act and its implementing regulations in Title VI of the New York Code of Rules and Regulations, Part 617.

Site: The parcel or parcels of land where a WECS is to be placed. The site can be publicly or privately owned by an individual or a group of individuals controlling single or adjacent properties. Where multiple lots are in joint ownership, the combined lots shall be considered as one for purposes of applying set back requirements. Any property that has a **WECS**, or has entered an agreement for said facility or a set back agreement, shall not be considered off-site.

Siting Agency: The applicant, person or persons who are applying to site a utility scale wind energy-deriving tower facility.

Small WECS: A wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than ten (10) kilowatts, and which is intended to primarily reduce consumption of utility power at that location.

Sound Pressure Level: Means that level which is equaled or exceeded a stated percentage of time. L_{10}-50 dBA indicates that at any hour of the day 50 dBA can be equaled or exceeded only ten (10%) percent of the time, or for six (6) minutes. The measurement of the sound pressure level can be done according to the international standard for acoustic noise measurement techniques for wind generators (IEC 61400-11), or other accepted procedures.

SWPPP: Stormwater Management Pollution Prevention Plan, as required by New York State Department of Environmental Conservation regulations.

Total Height: The height of the tower and the furthest vertical extension of the **WECS**.

Utility Scale: Means a **WECS** other than a Small **WECS**.

Wind energy conversion systems (WECS): Shall mean any mechanism designed for the purpose of converting, wind energy into electrical energy.

Wind Energy Facility: Any wind energy conversion system, Small WECS, or wind measurement tower, including all related infrastructure, electrical lines and substations, access roads, and other accessory structures and appurtances.

Wind Measurement Tower: A tower used for the measurement of meteorological data such as temperature, wind speed, and wind direction.

Wind Overlay Zoning District: A district which encompasses one or more underlying zones and that establishes requirements for Wind Energy Facilities.

SECTION 1603 Permits

A. No Wind Energy Facility shall be constructed, reconstructed, modified, or operated in the Town of Hanover except in compliance with this Local Law.

B. No **WECS** shall be constructed, reconstructed, modified, or operated in the Town of Hanover except in a Wind Energy Overlay District with a Special Use Permit approved pursuant to this Local Law.

C. No Wind Measurement Tower shall be constructed, reconstructed, modified, or operated in the Town of Hanover except pursuant to a Special Use Permit issued pursuant to this Local Law.

D. No Small Wind Energy Conversion System shall be constructed, reconstructed, modified, or operated in the Town of Hanover except pursuant to a Special Use Permit issued pursuant to this Local Law.

E. This Local Law shall apply to all areas of the Town of Hanover.

F. **Exemptions.** No permit or other approval shall be required under this Article for **WECS** utilized solely for agricultural operations in a state or county agricultural district, as long as the facility is set back at least one and a half times its Total Height from a property line, and does not exceed 120 feet in height. Towers over 120 feet in Total Height utilized solely for agricultural operations in a state or county agricultural district shall apply for a Special Use Permit in accordance with this Local Law, but shall not require a height variance. Prior to the construction of a **WECS** under this exemption, the property owner or a designated agent shall submit a sketch plan or building permit application to the Town to demonstrate compliance with the setback requirements.

G. **Transfer.** No transfer of any Wind Energy Facility or Special Use Permit, nor sale of the entity owning such facility including the sale of more than 30% of the stock of such entity (not counting sales of shares on a public exchange), will occur without prior approval of the Town, which approval shall be granted upon written acceptance of the transferee of the obligations of the transferor under this Section, and the transferee's

demonstration, in the sole discretion of the Town Board, that it can meet the technical and financial obligations of the transferor. No transfer shall eliminate the liability of the transferor nor of any other party under this Section unless the entire interest of the transferor in all facilities in the Town is transferred and there are no outstanding obligations or violations.

H. Notwithstanding the requirements of this Section, replacement in kind or modification of a Wind Energy Facility may occur without Town Board approval when (1) there will be no increase in Total Height; (2) no change in the location of the **WECS**; (3) no additional lighting or change in facility color; (4) no increase in noise produced by the **WECS**, and (5) the **WECS** is not currently in violation of any permit condition or provision of this Local Law.

I. The Town shall require any applicant to enter into an escrow agreement to pay the engineering and legal costs of any application review, including the review required by SEQRA.

SECTION 1604 Procedure

1. Applications for siting **WECS** facilities shall be submitted to the Hanover Code Enforcement officer. Applications shall be made by the owner of the property or his/her duly authorized representative, who shall attend the meeting of the Town Board to discuss the application. Any application deemed incomplete by the code enforcement officer or the Town Board shall be returned to the applicant and the Town or its Officer or Board shall undertake no action.
2. The Town Board may refer the application to the Planning Board for recommendations, which shall be reported by the Planning Board to Town Board within forty-five (45) days of said referral.
3. **Public Hearing:** After reviewing the site plan and recommendations, if any, from other involved Town or County Agencies, the Town Board shall hold a Public Hearing, which Public Hearing shall be held within sixty-two (62) days from the day the application is received by the Town Board. Notices of the Public Hearing shall be mailed to adjacent property owners within five hundred (500) feet from the property line boundaries of the proposed Wind Energy Overlay District and published in the Town's official newspaper, one time, not less then ten (10) nor more than twenty (20) days before said hearing. But where any hearing is adjourned by the Town Board to hear additional comments, no further publication or mailing shall be required.
4. The applicant shall prepare and mail the notice of public hearing prepared by the Town, and shall submit an affidavit of service to the Town Clerk. The assessment roll of the Town shall be used to determine mailing addresses.
5. The public hearing may be combined with public hearings on any environmental impact statement or requested waivers.

6. **Final Special Use permit and Site Plan:** A final site plan for the Special Use Permit application shall substantially conform to the site plan that has been approved, and may incorporate any revisions or other features recommended by the Town of Hanover Planning Board.
7. **Town of Hanover Town Board Action:** Within sixty-two (62) days from the date of the public hearing, the Hanover Town Board shall render a decision of approval, conditional approval or disapproval. This time period may be extended by mutual consent of the applicant and the Board. The decision of the Hanover Town Board shall be filed in the Office of the Town Clerk within five (5) business days after such decision is rendered, and a copy thereof mailed to the applicant.
8. **Conditions attached to the Issuance of Special Use Permits:** The Town of Hanover Town Board shall have the authority to impose reasonable conditions and restrictions as are directly related to and incidental to proposed special use permit. Upon its granting of said special use permit, any such conditions must be met in connection with the issuance of permits
9. **Reimbursable Costs:** Costs incurred by the Hanover Town and Planning Boards for consultation fees or other extraordinary expense in connection with the review of a proposed special use permit shall be charged to the applicant.

Section 1605 Wind Energy Conversion System Facility Permit Required

No Wind Energy Conversion System shall be sited, located, constructed, erected or modified without the issuance of a special use permit as prescribed in this article. (Reference 1603)

Section 1606 Zoning District and Bulk Requirements

1. WECS Facilities may be permitted in the Wind Overlay Zoning District, which may be created in the Agricultural Residential (A-1) District, upon the issuance by the Hanover Town Board of a Special Use Permit, under this Article; all applications will require a site plan as provided herein.
2. Setbacks. Each WECS shall be setback as measured from the center of the WECS a minimum distance of:

    a. 500 feet from the nearest Site boundary property line, right-of-way, easements, and power lines and 500 feet where the boundary is with state, county, town, or village –owned property.
    b. 500 feet from the nearest public road.
    c. 1,000 feet from the nearest off-site Residence, school, church or historic structure existing at the time of application, as measured to the exterior of such structure.

d. 100 feet from state-identified wetlands. This distance may be adjusted to be greater at the discretion of the reviewing body, based on topography, land cover, land uses, and other factors that influence the flight patterns of resident birds.
e. 500 feet from gas wells, electric or gas distribution lines unless waived in writing by the property owner and well owner or applicable utility owner.

3. **Noise Limit.** The statistical sound pressure level generated by a **WECS** shall not exceed L_{10} - 50 dBA measured at any off site Residence existing at the time of the application. If the ambient sound pressure level exceeds 48 dBA, the standard shall be ambient dBA plus 5 dBA. Independent certification shall be provided before and after construction demonstrating compliance with this requirement.
4. In the event audible noise due to **WECS** operations contains a steady pure tone, such as a whine, screech, or hum, the standards for audible noise set forth in subparagraph 3 of this subsection shall be reduced by 5 dBA. A pure tone is defined to exist if the 1/3 octave band sound pressure level in the band, including the tone, exceeds the arithmetic average of the sound pressure levels of the two contiguous 1/3 octave bands by 5 dBA for center frequencies of 500 Hz and above, by 8 dBA for center frequencies between 160 Hz and 400 Hz, or by 15 dBA for center frequencies less than or equal to 125 Hz.
5. In the event the ambient noise level (exclusive of the development in question) exceeds the applicable standard given above, the applicable standard shall be adjusted so as to equal the ambient noise level. The ambient noise level shall be expressed in terms of the highest whole number sound pressure level in dBA, which is exceeded for more than five minutes per hour. Ambient noise levels shall be measured at the exterior of potentially affected existing residences, schools, hospitals, churches, and public libraries. Ambient noise level measurement techniques shall employ all practical means of reducing the effect of wind generated noise at the microphone. Ambient noise level measurements may be performed when wind velocities at the proposed project Site are sufficient to allow Wind Turbine operation, provided that the wind velocity does not exceed 30 mph at the ambient noise measurement location.
6. Any noise level falling between two whole decibels shall be the lower of the two.
7. All applications for **WECS** exceeding 120 feet in height shall be treated as a Type One Action under the State Environmental Quality Review Act.

SECTION 1607: APPLICATION REQUIREMENTS

A plan for the proposed development of a project utility scale **WECS**, including the proposed Wind Energy Overlay District and individual Special Use Permit applications for **WECS** shall show and include the following:

A. Name of the project, the address and Section, Block and Lot number of each proposed **WECS** location and the boundary lines of the parcel on which the project will be located, a location map showing proposed sites location, date, North arrow and scale. Engineering and or Surveyor maps.

B. Name and mailing address of the developer or applicant and owners of the parcels where development is proposed.

C. Name and mailing address of all owners of record of abutting parcels, or those owners within fifteen hundred (1,500) feet of the property lines of parcel where development is proposed. The applicant may delay submitting this list until the Town Board calls for a public hearing on the application.

D. A map prepared by a surveyor or engineer licensed in the State of New York shall be provided in the EIS showing all existing lot lines, easements and right-of-ways, and a sketch plan showing proposed road access including provisions for paving, if any, proposed transmission lines and accessory facilities and location of all existing and proposed utility systems to the facility. A map of all above and below ground utilities near the tower site that could possibly be impacted.

E. Boundaries of the proposed Wind Energy Overlay Zoning District.

F. A map showing existing and proposed topography at a maximum of five (5) foot contour intervals. (Applies to utility scale only)

G. A landscape plan showing all existing natural land features, trees, forest cover, buildings and structures and all proposed changes to these features including size and type of plant material and erosion control measures. (Applies to utility scale only)

H. State Environmental Quality review Act (SEQRA). Nothing shall prohibit the Board from requiring an environmental impact statement if deemed necessary by the Board. WECS are considered a Type 1 action and require a full Environmental Assessment Form (EAF) and a visual EAF to be completed and submitted to the town.

I. Photography, assessing the visibility from the key viewpoints, existing tree lines and proposed elevations. Pictures shall be digitally enhanced to simulate the appearance of the "as built" above the ground site facilities as they would appear from distances within three (3) mile

radius of such **WECS**. No fewer than four (4) and no more than the number of proposed individual **WECS** plus three (3) color photos.

Pictures shall be no smaller than 8"x10". This requirement may be waived for Small **WECS**.

J. Documentation of the proposed intent and capacity of energy generation as well as a justification for the height of any WECS.

K. Justification for any clearing required. (Applies to utility scale only)

L. **Preliminary report proposed by the WECS siting agency describing**: (Applies to utility scale only)
   i. Surrounding topography in relation to the capabilities for generation of electricity by wind.
   ii. Required improvements for construction activities, including those within the public right-of-way or land controlled by the Town of Hanover.
   iii. Proposed mitigation measures for visual impacts of the tower facility.
   iv. Proposed safety measures to mitigate wind energy-deriving tower failure.

M. Elevation map showing the wind energy-deriving tower's height and design including a cross section of the structure and components of the nacelle; the wind energy-deriving tower's compliance with the applicable structural standards and the wind energy-deriving tower's abilities in terms of producing energy. (Applies to utility scale only)

N. A description of the general geographic areas that would be acceptable for wind projects within the Town of Hanover: furthermore, demonstration that the proposed site is the most appropriate site within the immediate area for the location of the **WECS**. (May waive for Small **WECS**)

O. Description of the applicant's long range plans with project market demand and long-range facility needs within the Town of Hanover. (May waive for Small **WECS**)

P. Digital elevation model-based project visibility map showing the impact of visibility of the project from other locations, to a distance radius of three (3) miles from the center of the project. The base map used shall be a published topographic map showing natural and structural or built features. (To be provided in the EIS. May waive for Small **WECS**)

Q. Report showing soil logs, soil profile analysis and storm water run-off calculation for the area being disturbed. (To be provided in the SWPPP and EIS. May waive for Small **WECS**)

R. Plans to prevent the pollution of the surface or ground water, erosion of soil, both during and after construction, excessive run-off and flooding of the other properties as applicable. There should be pre-construction and post –construction drainage calculations for the site done by a New York State licensed engineer showing there will be no increase of run-off from the site. (To be provided in the SWPPP and EIS, May waive for Small **WECS**)

S. All information regarding requirements for migratory bird flyways with documents by the EPA, NYSDEC or US Fish and Wildlife Service. (To be provided in the EIS, May waive for Small **WECS**)

T. All information regarding FAA rules and regulations, additional permits necessary or any other applicable regulations from the Federal Communications Commission (FCC) and Federal Aviation Agency (FAA) for installation of conversion systems. Proof of compliance with the FCC and FAA regulations shall be submitted prior to the finalization of the EIS and issuance of a Special Use Permit by the Town Board, Town of Hanover.

U. Blade Throw and Ice Throw Risk: Either the Application or the EIS shall evaluate the risk from Blade Throw and Ice Throw Risk.

V. **Catastrophic Tower Failure**: A report from the turbine manufacturer stating:

i. The wind speed and conditions that the turbine is designed to withstand (including all assumptions)

ii. The incidence of catastrophic failures and the conditions reported at the time of failure.

W. **Noise Report**: A noise report that shall at a minimum include the following: (May waive for Small **WECS**)

i. A description and map of the project's noise producing features, including the range of noise levels expected, and the tonal and frequency characteristics expected, and the basis of the expectation.

ii. A description and map of the noise sensitive receptors, i.e., residences, libraries, schools, places of worship and other facilities where quiet is important within two (2) miles of the proposed facility.

iii. A report prepared by a qualified engineer, that analyzes the pre-existing ambient daytime and nighttime noise regime (including seasonal variation), including but not limited to: separate measurements of low frequency and A-weighted noise levels across a range of wind speeds (including near cut-in), turbulence measurements, distance from the turbines, location of sensitive receptors relative to wind direction: and analyses at

affected sensitive receptors located two (2) miles of the proposed project site. Potential sensitive receptors at relatively less windy or quieter locations than the project should be emphasized.

iv. A description and map showing the potential noise impacts, including estimates of expected noise impacts upon construction and operation workers, and estimates of expected noise levels at sensitive receptor locations.

v. A description and map of the cumulative noise impacts.

vi. A description of the projects proposed noise control features, including specific measures proposed to protect workers, and specific measures proposed to mitigate noise impacts for sensitive receptors to a level of insignificance.

vii. Identification of any problem areas

viii. Summary of Project Developer's proposed Noise Complaint resolution Program, including post-construction testing.

ix. Manufactures Noise design and field-testing data both audible (dBA) and low frequency (deep base vibration) for all proposed structures.

Section 1608 - Standards:

The development of utility scale WECS and related structures may be permitted with approval by the Hanover Town Board, subject to the following requirements:

A. **Location**: Applications for wind energy-deriving towers shall locate, erect and site towers in accordance with the following requirements:

1. No **WECS** shall be installed in any location along the major axis of an existing microwave communications link where its operation is likely to produce electromagnetic interference in the link's operations.

2. No **WECS** shall be installed in any location where its proximity with existing fixed broadcast, retransmission, or reception antenna (including residential reception antenna) for radio, television, or wireless phone or other personnel communication systems would produce electromagnetic interference with signal transmission or reception. If it is determined that a **WECS** is causing electromagnetic interference, the applicant/operator shall take the necessary corrective action to eliminate this interference including

relocation or removal of the facilities, or resolution of the issue with the impacted parties. Failure to remedy electromagnetic interference is grounds for revocation of the Special Use Permit for the specific **WECS** or **WECS** causing the interference.

3. No individual tower facility shall be installed in any location where there is a recognized migratory flight path for birds or at a location where birds commonly congregate, unless applicant can demonstrate that the operation of the wind energy-deriving Tower will not have a significant impact on either migratory or resident birds. Conclusions of no significant impact within these recognized areas shall be the results of studies conducted over a period of a minimum of one year by expert consultants and in compliance with NYS DEC regulations, at the expense of the applicant.

4. **WECS** shall be painted a non-obtrusive (e.g. light environmental color such as white, gray or beige) color that is non reflective.

5. A New York State Licensed professional engineer shall certify that the construction and installation of the conversion system meets or exceeds the manufacture's construction and installation standards. (Town Board may waive for Small **WECS**)

B. Emergency Shutdown/Safety

1. Procedures acceptable to the Hanover Town Board for emergency shutdown of power generation unit shall be established and available with local agencies as required by the Town.

2. No tower or facility shall exhibit any signs or advertising. Applicant shall post an emergency telephone number so that the appropriate people may be contacted should any wind energy-deriving tower need immediate attention.

3. No **WECS** shall be permitted that lack an automatic braking, governing, or feathering system to prevent uncontrolled rotation, over speeding, and excessive pressure on the tower structure, rotor blades, and turbine components.

4. The safety of the design of all conversion systems shall be certified by a licensed professional engineer experienced in **WECS**. The standard for certification shall be good engineering practices and shall conform to New York State's officially adopted building and electrical codes.

5. The minimum distance between the ground and any part of the rotor blade shall be thirty (30) feet.

C. **Lighting:**

Lighting shall be in compliance with FAA regulations.

D. **Utility Service**

All power transmission lines from the wind generation electricity facilities to non-site substations shall be underground unless specifically waived by the Town Board as part of the Special Use Permit. Where the electrical components of an installation vary from the Manufacturer's standard design or specifications, the proposed modifications shall be reviewed and certified by a N.Y.S. registered professional engineer for compliance with requirements of the national Electrical Underwriter's Code and good engineering practices.

E. **Height:**

1. The height of any WECS shall be limited to the minimum required to provide needed energy by demonstrated demand, or need.

2. Small **WECS** shall not exceed a total of seventy-five (75) feet unless the parcel on which the **WECS** is to be located is ten (10) acres or more, in which case the maximum height of the tower, including the turbine and blades, shall be 120 feet.

3. **WECS** shall not exceed a total height of 420 feet including the turbine and blades.

E. **Access Road:**

Existing roadways shall be used for access to the site whenever possible. In the case of constructing roadways, they shall be constructed in a way so that they do not disrupt normal drainage patterns, and are not conspicuous to the surrounding environment.

G. **Accessory Structures/Facilities**

Transmission facilities and or buildings shall be located behind ridges or vegetation to screen from visibility unless specifically waived by the Town Board as part of the Special Use Permit. Removal of trees and other vegetation on the site shall affect the minimum area and number of trees possible to minimize soil erosion.

H. Security Provisions:

1. No climbing device of any kind shall be attached to the outside of a **WECS**. Only internal ladders with locked doors.

2. All towers or poles must be unclimbable by design or protected by anti-climbing devices.

3. A **WECS** is prohibited upon the roof of any structure unless the structure has been approved for installation of a conversion system by a structural engineer certified by the State of New York.

I. Compliance with the National Electrical Code:

1. Building permit applications shall be accompanied by a one line drawing identifying the electrical components of the wind system to be installed in sufficient detail to allow for a determination that the manner conforms to the National Electrical Code. The application shall include a statement from a New York State licensed professional engineer indicating that the electrical system conforms to good engineering practices and complies with the National Electrical Code. The manufacturer normally supplies this certification. All equipment and materials shall be used or installed in accordance with such drawings and diagrams.

2. All electrical lines shall be placed in compliance with the current electrical code standards and appropriately marked and identified as specified by the Town. A visible warning sign of "High Voltage" will be placed at the base of all **WECS**. The letters on the sign shall be a minimum of six (6) inches in height.

3. The applicant shall, prior to the receipt of a building permit, demonstrate that the proposed facility meets the system reliability requirements of the New York Independent System Operator, or provide proof that it has executed an Interconnection Agreement with the New York Independent System Operator and/or the applicable Transmission owner.

J. Insurance/Liability

The applicant, owner, lessee or assignee shall maintain a current insurance policy which will cover installation and operation of the **WECS** at all times. As part of the application review process, the Town of Hanover may require proof that the applicant is carrying sufficient liability, workers compensation, etc, during installation and operations of proposed facility. Limits for said policy shall be set according to the size and scope of each project.

K. Abatement:

1. Any **WECS** which has not been generating energy for a period of one (1) year shall be removed from the premises to a place of safe and legal disposal. Any and all structures, guy cables, guy anchors and or enclosures accessory to such **WECS** shall also be removed. The site shall be restored to as natural a condition as possible. Such removal shall be completed within six (6) months after 1 year of non-use of such **WECS**. The permittee is responsible for removal.

2. **Bond/Security**: All successful applicants shall furnish and file with the Town Clerk a performance bond to be payable to the Town and in an amount to be determined by the Town for the purpose of covering damage to any Town property during the construction, maintenance, operation or removal of the **WECS** facility.

3. **Decommissioning Security**. In addition, all successful applicants shall furnish and file with the Town Clerk a bond or other security for the purpose of paying for the removal of and de-commissioning of the **WECS** facilities in the event that such **WECS** facilities are no longer in use and require removal under this article and upon failure of the then-owner or operator to remove same in accordance with this article (such bond or other security, a "Decommissioning Bond"). The Decommissioning Bond shall remain valid and enforceable during the entire time the facility is permitted to operate and for an additional period of two years thereafter and as may be necessary to ensure the de-commissioning and removal of the **WECS** in the event the owner/operator fails to do so as required by this article. The Decommissioning Bond may consist of a letter of credit from a State of New York-licensed financial institution. All costs of the financial security shall be borne by the applicant.

4. **Decommissioning Plan**: The applicant shall submit a decommissioning plan, which shall include: 1) the anticipated life of the **WECS**; 2) the estimated decommissioning costs in current dollars; 3) how said estimate was determined; 4) the method of ensuring that funds will be available for decommissioning and restoration; (5) the method, such by annual re-estimate by a licensed engineer, that the decommissioning cost will be kept current; and 6) the manner in which the **WECS** will be decommissioned and the Site restored, which shall include removal of all structures and debris to a depth of three feet, restoration of the soil, and restoration of vegetation (consistent and compatible with surrounding vegetation), less any fencing or residual minor improvements requested by the landowner. The Plan shall include the Decommissioning Bond required by this Section.

5. If removal of towers and appurtenant facilities is required and applicant, permit holder, or successors fails to remove the towers and appurtenant facilities from the property within one hundred twenty (120) days from the date of notification by the Town Board, the Board shall contract for such removal and pay for removal from the Bond.

L. Right of Entry and Inspection:

Upon notice to the applicant, the Code Enforcement Officer or any duly authorized agent of the Town shall be allowed to enter on the property and make such inspections as deemed necessary during the construction and assembly of the **WECS,** and to ensure compliance with permit conditions.

M. Fees

Applications, permits, and inspection fees for WECS applicants under this article shall be as established by the Town Board of the Town of Hanover by Town Board Resolutions, as from time to time enacted.

SECTION 1609 – WECS FACILITIES MAINTENANCE

The Town Code Enforcement Officer and/or Building Inspector or outside consultant designated by the Town Board are empowered to enforce these regulations.

1. The sufficiency of the bond for removal shall be confirmed at least every year by an analysis of the cost of removal and property restoration performed by a licensed New York State professional Engineer with results to be communicated to the Town. If the bond amount in force is not sufficient to cover the cost of the removal, it shall be increased within thirty (30) days to cover such amount.
2. The Facility shall be inspected at least every two (2) years for structural Integrity by a New York licensed professional engineer and a copy of the inspection report submitted to the Town.
3. All **WECS** shall be maintained in good order and repair and all such work shall comply with all applicable code requirements of any governmental body issuing such rules and/or regulations.
4. No outside storage of vehicles, materials or waste shall be allowed except for the limited periods when the facility is undergoing construction, repair or maintenance.

SECTION 1610 – EXEMPTIONS

Notwithstanding the requirements of this Section, replacement in kind or modification of a Wind Energy Facility may occur without Town Board approval when (1) there will be no increase in Total Height; (2) no change in the location of the WECS; (3) no additional lighting or change in facility color; (4) no increase in noise produced by the WECS, and (5) the WECS is not currently in violation of any permit condition or provision of this Local Law

SECTION 1611 – PURPOSE AND INTENT—SMALL WIND ENERGY CONVERSION SYSTEM

1. The purpose of this section is to provide standards for Small WECS designed for home, farm, and Small **WECS** use on the same parcel, and that are primarily used to reduce consumption of utility power at that location and not for sale off-premises.
2. Applications for Small **WECS** energy permits shall include:
   a) Name, address, telephone number of the applicant. If the applicant will be represented by an agent, name, address, and telephone number of the agent, as well as an original signature.
   b) Name, address, telephone number of the property owner. If the property owner is not the applicant, the application shall include a letter or other written permission signed by the property owner (i) confirming that the property owner is familiar with the proposed applications and (ii) authorizing the submission of the application.
   c) Address of each proposed tower location, including Tax Map section, block and lot number.
   d) Evidence that the proposed tower height does not exceed the height recommended by the manufacturer or distributor of the system.
   e) A line drawing of the electrical components of the system in sufficient detail to allow for a determination that the manner of installation conforms to the Uniform Fire Prevention and Building Code.
   f) Sufficient information demonstrating that the system will be used primarily to reduce consumption of electricity at that location.
   g) Written evidence that the electric utility service provider that serves the proposed Site has been informed of the applicant's intent to install an interconnected customer-owned electricity generator, unless the applicant does not plan, and so states in the application, to connect the system to the electricity grid.
   h) A visual analysis of the Small **WECS** as installed, which may include a computerized photographic simulation, demonstrating the visual impacts from nearby strategic vantage points. The visual analysis shall also indicate the color treatment of the system's components and any visual screening incorporated into the project that is intended to lessen the system's visual prominence.

3. **Development Standards**. All Small wind energy systems shall comply with the following standards. Additionally, such systems shall also comply with all the requirements established by other sections of this Article that are not in conflict with the requirements contained in this section.

a) A system shall be located on a lot a minimum of one acre in size, however, this requirement can be met by multiple owners submitting a joint application.

b) Only one small wind energy system tower per legal lot shall be allowed, unless there are multiple applicants, in which their joint lots shall be treated as one lot for the purposes of this section.

c) Small **WECS** shall be used primarily to reduce the on-site consumption of electricity.

d) Tower heights may be allowed as follows:

(i.) See Section 1608 E (2).

(ii.) The allowed height shall be reduced if necessary to comply with all applicable Federal Aviation Requirements, including Subpart B (commencing with Section 77.11) of Part 77 of Title 14 of the Code of Federal Regulations regarding installations close to airports.

e) The maximum turbine power output is limited to 10 KW.

f) The system's tower and blades shall be painted a non-reflective, unobtrusive color that blends the system and its components into the surrounding landscape to the greatest extent possible and incorporate non-reflective surfaces to minimize any visual disruption.

g) The system shall be designed and located in such a manner to minimize adverse visual impacts from public viewing areas.

h) Exterior lighting on any structure associated with the system shall not be allowed except that which is specifically required by the Federal Aviation Administration.

i) All on-site electrical wires associated with the system shall be installed underground except for "tie-ins" to a public utility company and public utility company transmission poles, towers and lines. This standard may be modified by the decision-maker if the project terrain is determined to be unsuitable due to reasons of excessive grading, biological impacts, or similar factors.

j) The system shall be operated such that no disruptive electromagnetic interference is caused. If it has been demonstrated that a system is causing harmful interference, the system operator shall promptly mitigate the harmful interference or cease operation of the system.

k) At least one sign shall be posted on the tower at a height of five feet warning of electrical shock or high voltage and harm from revolving machinery. No brand names, logo or advertising shall be placed or painted on the tower, rotor, generator or tail vane where it would be visible from the ground, except that a system or tower's manufacturer's logo may be displayed on a system generator housing in an unobtrusive manner.

l) Anchor points for any guy wires for a system tower shall be located within the property that the system is located on and not on or across any above-ground electric transmission or distribution lines. The point of attachment for the guy wires shall be enclosed by a fence six feet high or sheathed in bright orange or yellow covering from three to eight feet above the ground.

m) Construction of on-site access roadways shall be minimized. Temporary access roads utilized for initial installation shall be re-graded and re-vegetated to the pre-existing natural condition after completion of installation.

n) To prevent harmful wind turbulence from existing structures, the minimum height of the lowest part of any horizontal axis wind turbine blade shall be at least 30 feet above the highest structure or tree within a 250 foot radius. Modification of this standard may be made when the applicant demonstrates that a lower height will not jeopardize the safety of the wind turbine structure.

o) All small wind energy system tower structures shall be designed and constructed to be in compliance with pertinent provisions of the Uniform Fire Prevention and Building Code.

p) All Small **WECS** shall be equipped with manual and automatic over-speed controls. The conformance of rotor and over-speed control design and fabrication with good engineering practices shall be certified by the manufacturer.

5. **Standards.** A Small **WECS** shall comply with the following standards:

   a) **Setback** requirements. A Small **WECS** shall not be located closer to a property line than one and a half times the total height of the facility.

   b) **Noise.** Except during short-term events, including utility outages and severe wind storms, a Small **WECS** shall be designed, installed, and operated so that noise generated by the system shall not exceed the 50 decibels (dBA) as measured at the closest neighboring inhabited dwelling.

6. **Abandonment of Use**. A Small **WECS** which is not used for twelve (12) successive months shall be deemed abandoned and shall be dismantled and removed from the property at the expense of the property owner. Failure to abide by and faithfully comply with this section or with any and all conditions that may be attached to the granting of any building permit shall constitute grounds for the revocation of the permit by the Town.

   All Small **WECS** shall be maintained in good condition and in accordance with all requirements of this section.

7. A Small **WECS** shall be permitted only in Zoning District (A-1), Agricultural Residential.

SECTION 1612 – WIND MEASUREMENT TOWERS

1. **Wind Site Assessment**. The Town Board acknowledges that prior to construction of a **WECS**, a wind site assessment is conducted to determine the wind speeds and the feasibility of using particular sites. Installation of Wind Measurement Towers, also known as anemometer ("MET") towers, shall be permitted on the issuance of a Special Use Permit in accordance with this section.

2. **Applications for Wind Measurement Towers.**

A. An application for a Wind Measurement Tower shall include:

   a) Name, address, telephone number of the applicant. If the applicant is represented by an agent, the application shall include the name,

address, and telephone number of the agent as well as an original signature of the applicant authorizing the representation.

b) Name, address, telephone number of the property owner. If the property owner is not the applicant, the application shall include a letter or other written permission signed by the property owner (i) confirming that the property owner is familiar with the proposed applications and (ii) authorizing the submission of the application.

c) Address of each proposed tower location, including Tax Map section, block and lot number.

d) Proposed Development Plan and Map.

e) **Decommissioning Plan:** The applicant shall submit a decommissioning plan, which shall include: 1) the anticipated life of the Wind Measurement Tower; 2) the estimated decommissioning costs in current dollars; 3) how said estimate was determined; 4) the method of ensuring that funds will be available for decommissioning and restoration; (5) the method, such by annual re-estimate by a licensed engineer, that the decommissioning cost will be kept current; and 6) the manner in which the Wind Measurement Tower will be decommissioned and the Site restored, which shall include removal of all structures and debris to a depth of three feet, restoration of the soil, and restoration of vegetation (consistent and compatible with surrounding vegetation), less any fencing or residual minor improvements requested by the landowner. The Plan shall include the Decommissioning Bond required by this Section.

f. **Decommissioning Security.** The applicant, or successors, shall continuously maintain a fund or bond payable to the Town for the removal of non-functional towers and appurtenant facilities in an amount to be determined by the Town for the period of the of the life of the facility. This fund may consist of a letter of credit from a State of New York-licensed financial institution. All costs of the financial security shall be borne by the applicant.

3. **Standards for Wind Measurement Towers.**

A. The distance between a Wind Measurement Tower and the property line shall be at least one and a half times the total height of the tower. Sites can include more than one piece of property and the requirement shall apply to the combined properties. Exceptions for neighboring property are also allowed with the consent of those property owners.

B. Special Use Permits for Wind Measurement Towers may be issued for a period of up to two years. Permits shall be renewable upon application to the Town Board in accordance with the procedure of § 1-20.

SECTION 1613 – VIOLATIONS/PENALTIES

This article is adopted pursuant to the zoning and planning powers granted to the Town under Town Law of the State of New York and other applicable law, rule and regulation. In the event of any violation of this article or permit issued hereunder, the Town may

seek enforcement under any available authority, including but not limited to Town Law, Section 268, as from time to time amended.

Any applicant upon receipt of a Special Use Permit for a Wind Energy Conversion System Facility that substantially does not meet any of the requirements and/or conditions of that permit, shall have its permit revoked and the **WECS** Facility removed within one hundred twenty (120) days of notification by the Town of such violation. Nothing herein shall limit or prohibit the Town from seeking equitable or injunctive relief for a violation of this article in any court of competent jurisdiction.

SECTION 1614 – HOST COMMUNITY AGREEMENT

Nothing in this Article shall be read as limiting the ability of the Town to enter into Host Community Agreements with any applicant to compensate the Town for expenses or impacts on the community.

SECTION 1615 – TAX EXEMPTION

The Town hereby exercises its right to opt out of the Tax Exemption provisions of Real Property Tax Law Section 487, pursuant to the authority granted by paragraph 8 of that law.

SECTION 1616 - SEVERABILITY

Should any provision of this Local Law be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of this Local Law as a whole or any part thereof other than the part so decided to be unconstitutional or invalid.

SECTION 1617 - MISCELLANEOUS

The amendments in this local law shall apply to any and all applications pending at the time of enactment for which final permits have not been issued.

SECTION 1618 - REPEALER

That the enactment of this local law shall act as a repealer of Local Law No. 4 of 2006 previously enacted by the Town Board of the Town of Hanover providing for wind energy conversion systems. That in the event of any conflict in local law, ordinance, rule or regulation having to do with wind energy conversion systems and wind energy facilities, the provisions of this Local Law shall prevail.

SECTION 1619 – EFFECTIVE DATE

This local law shall be effective upon its filing with the Secretary of State in accordance with the Municipal Home Rule Law.

Effective Date: _____

Local Law No. 1 of 2007

A LOCAL LAW GOVERNING WIND ENERGY FACILITIES IN THE TOWN OF VILLENOVA

Be it hereby enacted by the Town Board of the Town of Villenova as follows:

Section 1: Title

This Local Law shall be known as the "Wind Energy Facilities Law of the Town of Villenova."

Section 2: Section 401(C) of the Town of Villenova Zoning Law - Uses by Special Use Permit in the Agricultural - Residential (AR1) District, is amended to replace

Windmills - private in accordance with Section 617

to read
Wind Energy Facilities in accordance with Article VI-A

Section 3: Section 402(C) of the Town of Villenova Zoning Law - Uses by Special Use Permit in the Transition (T) District, is amended to replace

Windmills - private in accordance with Section 617

to read

Wind Energy Facilities in accordance with Article VI-A.

Section 4: Section 403(C) of the Town of Villenova Zoning Law - Uses by Special Use Permit in the Industrial Park (IP) District, is amended to replace

Windmills - private in accordance with Section 617

to read

Wind Energy Facilities in accordance with Article VI-A

Section 5: Sections 617.00 through and including Section 617.13 of the Town of Villenova Zoning Law are hereby repealed.

Section 6: Section 617, "Commercial Towers/Windmills" of the Town of Villenova Zoning Law is hereby amended as follows:

a. The Title of Section 617 shall be “Commercial Towers.”

b. The first sentence of Section 617 shall read in its entirety as follows “Commercial Towers in districts where allowed shall be subject to the following conditions:”

c. The first sentence of Section 617(A) shall read in its entirety as follows “Towers shall be removed from surrounding residential structures sufficiently so as to not cause a nuisance due to appearance or other factors.”

Section 7: Article VI-A is hereby added to the Town of Villenova Zoning Law to read in its entirety as follows:

Article VI-A

WIND ENERGY FACILITIES

§ 690.00. Purpose.

The Town Board of the Town of Villenova adopts this Article to promote the effective and efficient use of the Town’s wind energy resource through wind energy conversion systems (WECS), and to regulate the placement of such systems so that the public health, safety, and welfare will not be jeopardized.

§ 690.01. Authority.

A. The Town Board of the Town of Villenova adopts this Article under the authority granted by:

Article IX of the New York State Constitution, § 2(c)(6) and (10).

New York Statute of Local Governments, § 10 (1), (6), and (7).

New York Municipal Home Rule Law, § 10 (1)(i) and (ii) and § 10 (1)(a)(6), (11), (12), and (14).

The supersession authority of New York Municipal Home Rule Law, § 10 (2)(d)(3).

New York Town Law, Article 16 (Zoning).

New York Town Law § 130(1)(Building Code), (3)(Electrical Code), (5)(Fire Prevention), (7)(Use of streets and highways), (7-a)(Location of Driveways), (11)(Peace, good order and safety), (15)(Promotion of public welfare), (15-a)(Excavated Lands), (16)(Unsafe buildings), (19)(Trespass), and (25)(Building lines).

New York Town Law § 64(17-a)(protection of aesthetic interests) and (23)(General powers).

§ 690.02. Findings.

A. The Town Board of the Town of Villenova finds and declares that

1. Wind energy is an abundant, renewable, and nonpolluting energy resource of the Town and its conversion to electricity may reduce dependence on nonrenewable energy sources and decrease the air and water pollution that results from the use of conventional energy sources.

2. The generation of electricity from properly sited wind turbines, including small systems, can be cost effective, and in many cases existing power distribution systems can be used to transmit electricity from wind-generating stations to utilities or other users, or on-site consumption can be reduced.

3. Regulation of the siting and installation of wind turbines is necessary for the purpose of protecting the health, safety, and welfare of neighboring property owners and the general public.

4. Wind Energy Facilities represent significant potential aesthetic impacts because of their large size, lighting, and shadow flicker effects.

5. If not properly regulated, installation of Wind Energy Facilities can create drainage problems through erosion and lack of sediment control for facility sites and access roads, and harm farmlands through improper construction methods.

6. Wind Energy Facilities may present a risk to bird and bat populations if not properly sited.

7. If not properly sited, Wind Energy Facilities may present risks to the property values of adjoining property owners.

8. Wind Energy Facilities are significant sources of noise, which, if unregulated, can negatively impact adjoining properties.

9. Construction of Wind Energy Facilities can create traffic problems and damage local roads.

10. Wind Energy Facilities can cause electromagnetic interference issues with various types of communications.

§ 690.03. Definitions.

A. As used in this Article, the following terms shall have the meanings indicated:

1. AGRICULTURAL OR FARM OPERATIONS — means the land and on-farm buildings, equipment, manure processing and handling facilities, and practices which contribute to the

production, preparation, and marketing of crops, livestock, and livestock products as a commercial enterprise, including a commercial horse boarding operation," as defined in New York Agriculture and Markets Law § 301 and "timber processing," as defined in subdivision fourteen of New York Agriculture and Markets Law § 301. Such farm operation may consist of one or more parcels of owned or rented land, which parcels may be contiguous or noncontiguous to each other.

2. EAF — Environmental Assessment Form used in the implementation of the SEQRA as that term is defined in Part 617 of Title 6 of the New York Codes, Rules and Regulations.

3. RESIDENCE — means any dwelling suitable for habitation existing in the Town of Villenova on the date SEQRA for the specific application is completed, including seasonal homes, hotels, hospitals, motels, dormitories, sanitariums, nursing homes, senior housing, schools or other buildings used for educational purposes. A residence may be part of a multi-dwelling or multipurpose building, but shall not include correctional institutions or a hunting cabin.

4. SEQRA — the New York State Environmental Quality Review Act and its implementing regulations in Title 6 of the New York Codes, Rules and Regulations, Part 617.

5. SOUND PRESSURE LEVEL — means the level which is equaled or exceeded a stated percentage of time. An L_{10} - 50 dBA indicates that in any hour of the day 50 dBA can be equaled or exceeded only 10% of the time, or for 6 minutes. The measurement of the sound pressure level can be done according to the International Standard for Acoustic Noise Measurement Techniques for Wind Generators (IEC 61400-11), or other accepted procedures.

6. SMALL WIND ENERGY CONVERSION SYSTEM ("Small WECS") — A wind energy conversion system consisting of a wind turbine, a tower, and associated control or conversion electronics, which has a rated capacity of not more than 100 kW and which is intended to primarily reduce on-Site consumption of utility power.

7. SITE — The parcel(s) of land where the Wind Energy Facility is to be placed. The Site could be publicly or privately owned by an individual or a group of individuals controlling single or adjacent properties. Where multiple lots are in joint ownership, the combined lots shall be considered as one for purposes of applying setback requirements. Any property which has a Wind Energy Facility or has entered an agreement for said Facility or a setback agreement and received the required variance shall not be considered off-site.

8. TOTAL HEIGHT — The height of the tower and the furthest vertical extension of the WECS.

9. WIND ENERGY CONVERSION SYSTEM ("WECS") — A machine that converts the kinetic energy in the wind into a usable form (commonly known as a "wind turbine" or "windmill").

10. WIND ENERGY FACILITY — Any Wind Energy Conversion System, including Small Wind Energy Conversion Systems, or Wind Measurement Tower, including all related infrastructure, electrical lines and substations, access roads, and accessory structures.

11. WIND MEASUREMENT TOWER — a tower used for the measurement of meteorological data such as temperature, wind speed, and wind direction.

12. WIND OVERLAY DISTRICT — a district which encompasses part or parts of one or more underlying districts and that establishes requirements for Wind Energy Facilities.

§ 690.04. Permits and Rezoning Required.

A. No Wind Energy Facility shall be constructed, reconstructed, modified, or operated in the Town of Villenova except in compliance with this Article.

B. No WECS including Small WECS shall be constructed, reconstructed, modified, or operated in the Town of Villenova except in a Wind Overlay District, pursuant to an application for rezoning and for special use permit approved pursuant to this Article.

C. No Wind Measurement Tower shall be constructed, reconstructed, modified, or operated in the Town of Villenova except pursuant to a Special Use Permit issued pursuant to this Article, except as allowed by subdivision H of this Section.

D. Notwithstanding any other provision of this Zoning Local Law, Special Use Permits for Wind Energy Facilities shall be issued by the Town Board.

E. Exemptions. No permit or other approval shall be required under this Article for WECS utilized solely for agricultural operations in a state or county agricultural district, as long as the facility is set back at least one and a half times its Total Height from a property line, and does not exceed 120 feet in height. Towers over 120 feet in Total Height utilized solely for agricultural operations in a state or county agricultural district shall apply for a special use permit in accordance with this Local Law, but shall not require a height variance. Prior to the construction of a WECS under this exemption, the property owner or a designated agent shall submit a sketch plan or building permit application to the Town to demonstrate compliance with the setback requirements.

F. This Article shall apply to all areas of the Town of Villenova.

G. Transfer. No transfer of any Wind Energy Facility or Special Use Permit, nor sale of the entity owning such facility including the sale of more than 30% of the stock of such entity (not counting sales of shares on a public exchange), will occur without prior approval of the Town, which approval shall be granted upon written acceptance of the transferee of the obligations of the transferor under this Article, and the transferee's demonstration, in the sole discretion of the Town Board, that it can meet the technical and financial obligations of the transferor. No transfer shall eliminate the liability of the transferor nor of any other party under this Article

unless the entire interest of the transferor in all facilities in the Town is transferred and there no outstanding obligations or violations.

H. Notwithstanding the requirements of this Article, replacement in kind or modification of a Wind Energy Facility may occur without Town Board approval when (1) there will be no increase in Total Height; (2) no change in the location of the WECS; (3) no additional lighting or change in facility color; and (4) no increase in noise produced by the WECS.

§ 690.05. Applicability.

A. The requirements of this Article shall apply to all Wind Energy Facilities proposed, operated, modified, or constructed after the effective date of this Article.

B. Wind Energy Facilities for which a required permit has been properly issued and upon which construction has commenced prior to the effective date of this Article, shall not be required to meet the requirements of this Article; provided, however, that

1. Any such preexisting Wind Energy Facility which does not provide energy for a continuous period of twelve (12) months shall meet the requirements of this Article prior to recommencing production of energy.

2. No modification or alteration to an existing Wind Energy Facility shall be allowed without full compliance with this Article.

3. Any Wind Measurement Tower existing on the effective date of this Article shall be removed no later than twenty-four (24) months after said effective date, unless a Special Use Permit for said Wind Energy Facility is obtained.

C. Wind Energy Facilities may be either principal or accessory uses. A different existing use or an existing structure on the same Site shall not preclude the installation of a Wind Energy Facility or a part of such facility on such Site. Wind Energy Facilities constructed and installed in accordance with this Article shall not be deemed expansions of a nonconforming use or structure.

§ 690.06. Wind Overlay District Rules.

A. Wind Overlay District may be created in the Agricultural-Residential (AR1) District, the T-Transitional Use District, and the Industrial Park (IP) District only.

B. Initial requests for Wind Overlay Districts shall be submitted with applications for WECS Special Use Permits. No Wind Overlay District may be initially created without specific requests for WECSs.

C. Once a Wind Overlay District has been created, new WECSs or accessory structures or facilities may be added in that District by grant of a Special Use Permit pursuant to the requirements of this Article.

§ 690.07. Applications for Wind Energy Conversion Systems and Wind Overlay District.

A. A joint application for creation of a Wind Overlay District and Special Use Permit for individual WECS shall include the following:

1. Name, address, and telephone number of the applicant. If the applicant is represented by an agent, the application shall include the name, address, and telephone number of the agent as well as an original signature of the applicant authorizing the representation.

2. Name and address of the property owner. If the property owner is not the applicant, the application shall include a letter or other written permission signed by the property owner (i) confirming that the property owner is familiar with the proposed applications and (ii) authorizing the submission of the application.

3. Address, or other property identification, of each proposed tower location, including Tax Map section, block, and lot number.

4. A description of the project, including the number and maximum rated capacity of each WECS.

5. A plot plan prepared by a licensed surveyor or engineer drawn in sufficient detail to clearly describe the following.

(a) Property lines and physical dimensions of the Site.

(b) Location, approximate dimensions, and types of major existing structures, including all residences, and uses on Site, public roads, and adjoining properties within five hundred (500) feet of the boundaries of the proposed Wind Overlay District.

(c) Location and elevation of each proposed WECS.

(d) Location of all above ground utility lines on the Site or within one radius of the Total Height of the WECS, transformers, power lines, interconnection point with transmission lines, and other ancillary facilities or structures.

(e) Location and size of structures above 35 feet within a five-hundred-foot radius of the proposed WECS. For purposes of this requirement, electrical transmission and distribution lines, antennas, and slender or open lattice towers are not considered structures.

(f) The zoning designation of the subject and adjacent properties as set forth on the official Town Zoning Map.

(g) Proposed boundaries of the Wind Overlay District.

(h) To demonstrate compliance with the setback requirements of this Article, circles drawn around each proposed tower location equal to:

(i) One and a half times the tower height radius.

(ii) Five-hundred foot radius.

(iii) One-thousand two-hundred foot radius.

(i) Location of residential structures within one thousand two hundred feet of each proposed tower. The distance from the center of the tower to any off-site residence within one thousand feet shall be noted.

(j) All proposed facilities, including access roads, electrical lines, substations, storage or maintenance units, and fencing.

6. Vertical drawing of the WECS showing Total Height, turbine dimensions, tower and turbine colors, ladders, distance between ground and lowest point of any blade, location of climbing pegs, and access doors. One drawing may be submitted for each WECS of the same type and Total Height.

7. Landscaping Plan depicting vegetation describing the area to be cleared and the specimens proposed to be added, identified by species and size of specimen at installation and their locations.

8. Lighting Plan showing any FAA-required lighting and other proposed lighting. The application should include a copy of the determination by the Federal Aviation Administration to establish required markings and/or lights for the structure, but if such determination is not available at the time of the application, no building permit for any lighted facility may be issued until such determination is submitted.

9. List of property owners, with their mailing addresses, within 500 feet of the boundaries of the proposed Wind Overlay District. The applicant may delay submitting this list until the Town Board calls for a public hearing on the application.

10. Decommissioning Plan: The applicant shall submit a decommissioning plan, which shall include: 1) the anticipated life of the WECS; 2) the estimated decommissioning costs in current dollars; 3) how said estimate was determined; 4) the method of ensuring that funds will be available for decommissioning and restoration; 5) the method, such by annual re-estimate by a licensed engineer, that the decommissioning cost will be kept current; and 6) the

manner in which the WECS will be decommissioned and the Site restored, which shall include removal of all structures and debris to a depth of three feet, restoration of the soil, and restoration of vegetation (consistent and compatible with surrounding vegetation), less any fencing or residual minor improvements requested by the landowner. The Plan shall include the Decommissioning Bond required by this Article.

11. Complaint Resolution: The application will include a complaint resolution process to address complaints from nearby residents. The process may use an independent mediator or arbitrator and include a time limit for acting on a complaint.

12. An application shall include information relating to the construction/installation of the wind energy conversion facility as follows:

(a) A construction schedule describing commencement and completion dates; and

(b) A description of the routes to be used by construction and delivery vehicles, the gross weights and heights of those loaded vehicles.

13. Completed Part 1 of the Full EAF.

14. Applications for Special Use Permits for Wind Measurement Towers subject to this Article may be jointly submitted with the WECS.

15. For each proposed WECS, include make, model, picture, and manufacturer's specifications, including noise decibels data. Include Manufacturers' Material Safety Data Sheet documentation for the type and quantity of all materials used in the operation of all equipment including, but not limited to, all lubricants, and coolants.

16. If the applicant agrees in writing in the application that the proposed WECS may have a significant adverse impact on the environment, the Town Board shall issue a positive declaration of environmental significance.

17. If a positive declaration of environmental significance is determined by the SEQRA lead agency, the following information shall be included in the Draft Environmental Impact Statement ("DEIS") prepared for a Wind Energy Facility. Otherwise, the following studies shall be submitted with the application:

(a) Shadow Flicker: The applicant shall conduct a study on potential shadow flicker. The study shall identify locations where shadow flicker may be caused by the WECSs and the expected durations of the flicker at these locations. The study shall identify areas where shadow flicker may interfere with residences and describe measures that shall be taken to eliminate or mitigate the problems.

(b) Visual Impact: Applications shall include a visual impact study of the proposed WECS as installed, which may include a computerized photographic simulation, demonstrating any visual impacts from strategic vantage points. Color photographs of the proposed Site from at least two locations accurately depicting the existing conditions shall be included. The visual analysis shall also indicate the color treatment of the system's components and any visual screening incorporated into the project that is intended to lessen the system's visual prominence.

(c) A fire protection and emergency response plan, created in consultation with the fire department(s) having jurisdiction over the proposed Wind Overlay District.

(d) Noise Analysis: a noise analysis by a competent acoustical consultant documenting the noise levels associated with the proposed WECS. The study shall document noise levels at property lines and at the nearest residence not on the Site (if access to the nearest residence is not available, the Town Board may modify this requirement). The noise analysis shall provide pre-existing ambient noise levels and include low frequency noise.

(e) Property value analysis prepared by a licensed appraiser in accordance with industry standards, regarding the potential impact of values of properties adjoining WECS Sites, including properties across public roads from the Site.

(f) An assessment of potential electromagnetic interference with microwave, radio, television, personal communication systems, and other wireless communication.

18. Tower design information sufficient to demonstrate compliance with wind-loading requirements.

19. Analysis of potential ice-throwing and damage from blade throw impacts.

20. A statement, signed under penalty of perjury, that the information contained in the application is true and accurate.

§ 690.08. Application Review Process.

A. Applicants may request a pre-application meeting with the Town Board, or with any consultants retained by the Town Board for application review

B. Six copies of the application shall be submitted to the Town Clerk. Payment of all application fees shall be made at the time of application submission. If any variances are requested, variance application fees shall be paid at the time of the receipt of the application.

C. Town staff or Town-designated consultants shall, within 30 days of receipt, or such longer time if agreed to by the applicant, determine if all information required under this Article is included in the application.

D. If the application is deemed incomplete, the Town Board or its designated reviewer shall provide the applicant with a written statement listing the missing information. No refund of application fees shall be made, but no additional fees shall be required upon submittal of the additional information unless the number of WECSs proposed is increased.

E. Upon submission of a complete application, including the grant of any application waiver by the Town Board, the Town Clerk shall transmit the application to the Town Board. The applicant shall post the completed application and any accepted environmental impact statements on the Internet. The application shall be referred to the Planning Board in accordance with this Local Law.

F. The Town Board shall hold at least one public hearing on the application. Notice shall be given by first class mail to property owners within 500 feet of the boundaries of the proposed Wind Overlay District, and published in the Town's official newspaper, no less than ten nor more than twenty days before any hearing, but, where any hearing is adjourned by the Town Board to hear additional comments, no further publication or mailing shall be required. The applicant shall prepare and mail the Notice of Public Hearing prepared by the Town, and shall submit an affidavit of service. The assessment roll of the Town shall be used to determine mailing addresses.

G. The public hearing may be combined with public hearings on any Environmental Impact Statement or requested variances.

H. Notice of the project shall also be given, when applicable, to (1) the Chautauqua County Planning Board, if required by General Municipal Law §§ 239-l and 239-m, and (2) to adjoining Towns under Town Law § 264.

I. SEQRA Review. Applications for WECS are deemed Type I projects under SEQRA. The Town shall conduct its SEQRA review in conjunction with other agencies, and the record of review by said agencies shall be part of the record of the Town's proceedings. The Town may require an escrow agreement for the engineering and legal review of the applications and any environmental impact statements before commencing its review. At the completion of the SEQRA review process, if a positive declaration of environmental significance has been issued and an environmental impact statement prepared, the Town shall issue a Statement of Findings, which Statement may also serve as the Town's decision on the applications.

J. Upon receipt of the report of the recommendation of the County Planning Board (where applicable), and the report of the recommendation of the Town Planning Board (where applicable), the holding of the public hearing, and the completion of the SEQRA process, the Town Board may approve, approve with conditions, or deny the applications, in accordance with the standards in this Article.

§ 690.09. Standards for WECS.

A. The following standards shall apply to all WECS and related infrastructure, unless specifically waived by the Town Board as part of a permit.

1. All power transmission lines from the tower to any building or other structure shall be located underground to the maximum extent practicable.

2. No television, radio, or other communication antennas may be affixed or otherwise made part of any WECS, except pursuant to the telecommunications provisions of the Town Zoning Code. Applications may be jointly submitted for WECS and telecommunications facilities.

3. No advertising signs are allowed on any part of the Wind Energy Facility, including fencing and support structures.

4. Lighting of tower. No tower shall be lit except to comply with FAA requirements. Minimum security lighting for ground level facilities shall be allowed as approved on the Site plan. Security lighting shall be designed to minimize light pollution, including the use of light hoods, low glare fixtures, and directing lights at the ground.

5. All applicants shall use measures to reduce the visual impact of WECSs to the extent possible. WECSs shall use tubular towers. All structures in a project shall be finished in a single, non-reflective matte finished color or a camouflage scheme. Individual WECSs within a Wind Overlay District shall be constructed using wind turbines whose appearance, with respect to one another, is similar within and throughout the District, to provide reasonable uniformity in overall size, geometry, and rotational speeds. No lettering, company insignia, advertising, or graphics shall be on any part of the tower, hub, or blades.

6. The use of guy wires is prohibited.

7. No WECS shall be installed in any location where its proximity with existing fixed broadcast, retransmission, or reception antenna for radio, television, or wireless phone or other personal communication systems would produce electromagnetic interference with signal transmission or reception. No WECS shall be installed in any location along the major axis of an existing microwave communications link where its operation is likely to produce electromagnetic interference in the link's operation. If it is determined that a WECS is causing electromagnetic interference, the operator shall take the necessary corrective action to eliminate this interference including relocation or removal of the facilities, or resolution of the issue with the impacted parties. Failure to remedy electromagnetic interference is grounds for revocation of the Special Use Permit for the specific WECS or WECSs causing the interference.

8. All solid waste and hazardous waste and construction debris shall be removed from the Site and managed in a manner consistent with all appropriate rules and regulations.

9. WECSs shall be designed to minimize the impacts of land clearing and the loss of open space areas. Land protected by conservation easements shall be avoided when feasible. The use of previously developed areas will be given priority wherever possible.

10. WECSs shall be located in a manner that minimizes significant negative impacts on rare animal species in the vicinity, particularly bird and bat species.

11. WECS and related infrastructure shall be located in a manner consistent with all applicable state and Federal wetlands laws and regulations.

12. Storm-water run-off and erosion control shall be managed in a manner consistent with all applicable state and Federal laws and regulations.

13. The maximum Total Height of any WECS shall be 420 feet.

14. Construction of the WECS shall be limited to the hours of 7 a.m. to 8 p.m. except for certain activities that require cooler temperatures than possible during the day, subject to approval from the Town.

15. Substations required to serve WECS are an Essential Public Service under this Zoning Code. Substations shall be screened from public view to the extent possible.

16. The Town of Villenova shall be named as an additional insured under the general liability policy of the applicant, the amount of which insurance shall be no less than an amount to be determined by the Town Board given the nature and scope of the project proposed by the applicant.

17. Any construction or ground disturbance involving agricultural land shall be done in according to the NYS Department of Agriculture and Markets' publication titled Guidelines for Agricultural Mitigation for Wind Power Projects.

§ 690.10. Required Safety Measures.

A. Each WECS shall be equipped with both manual and automatic controls to limit the rotational speed of the rotor blade so it does not exceed the design limits of the rotor.

B. If the property owner submits a written request that fencing be required, a six-foot-high fence with a locking portal shall be required to enclose each tower or group of towers. The color and type of fencing for each WECS installation shall be determined on the basis of individual applications as safety needs dictate.

C. Appropriate warning signs shall be posted. At least one sign shall be posted at the base of the tower warning of electrical shock or high voltage. A sign shall be posted on the entry area of fence around each tower or group of towers and any building (or on the tower or building if there is no fence), containing emergency contact information, including a local telephone number

with 24 hour, 7 day a week coverage. The Town Board may require additional signs based on safety needs.

D. No climbing pegs or tower ladders shall be located closer than twelve (12) feet to the ground level at the base of the structure for freestanding single pole.

E. The minimum distance between the ground and any part of the rotor or blade system shall be twenty (20) feet.

F. WECSs shall be designed to prevent unauthorized external access to electrical and mechanical components and shall have access doors that are kept securely locked.

G. Accurate maps of the underground facilities shall be filed with the town and with "Dig Safely New York (1-800-962-7962)" or its successor.

§ 690.11. Traffic Routes.

A. Construction of WECS poses potential risks because of the large size construction vehicles and their impact on traffic safety and their physical impact on local roads. Construction and delivery vehicles for WECS and/or associated facilities shall use traffic routes established as part of the application review process. Factors in establishing such corridors shall include (1) minimizing traffic impacts from construction and delivery vehicles; (2) minimizing WECS related traffic during times of school bus activity; (3) minimizing wear and tear on local roads; and (4) minimizing impacts on local business operations. Permit conditions may require remediation during construction, limit WECS-related traffic to specified routes, and include a plan for disseminating traffic route information to the public, and all applicable state, county, and municipal highway authorities and superintendents whose roads are included in the WECS traffic routes plan. Notification to all applicable highway authorities and superintendents will include the number and type of vehicles and their size, their maximum gross weight, the number of round trips, and the dates and time periods of expected use of designated traffic routes.

B. The applicant is responsible for remediation of damaged roads upon completion of the installation or maintenance of a WECS. A public improvement bond shall be posted prior to the issuance of any building permit in an amount, determined by the Town Board, sufficient to compensate the Town for any damage to local roads.

C. If the applicant uses any seasonal use highway in the off-season, it shall be solely responsible for the maintenance of said highway including but not limited to snow plowing. No act of maintenance on a seasonal use highway by an applicant shall be considered as Town maintenance of that highway for purposes of determining the seasonal use status of the highway.

§ 690.12. Setbacks for Wind Energy Conversion Systems.

A. The statistical sound pressure level generated by a WECS shall not exceed L_{10} - 50 dBA measured at the closest exterior wall of any residence existing at the time of completing the

SEQRA review of the application. If the ambient sound pressure level exceeds 50 dBA, the standard shall be ambient dBA plus 5 dBA. Independent certification shall be provided before and after construction demonstrating compliance with this requirement.

B. In the event audible noise due to WECS operations contains a steady pure tone, such as a whine, screech, or hum, the standards for audible noise set forth in subparagraph 1) of this subsection shall be reduced by five (5) dBA. A pure tone is defined to exist if the one-third (1/3) octave band sound pressure level in the band, including the tone, exceeds the arithmetic average of the sound pressure levels of the two (2) contiguous one third (1/3) octave bands by five (5) dBA for center frequencies of five hundred (500) Hz and above, by eight (8) dBA for center frequencies between one hundred and sixty (160) Hz and four hundred (400) Hz, or by fifteen (15) dBA for center frequencies less than or equal to one hundred and twenty-five (125) Hz.

C. In the event the ambient noise level (exclusive of the development in question) exceeds the applicable standard given above, the applicable standard shall be adjusted so as to equal the ambient noise level. The ambient noise level shall be expressed in terms of the highest whole number sound pressure level in dBA, which is exceeded for more than five (5) minutes per hour. Ambient noise levels shall be measured at the exterior of potentially affected existing residences. Ambient noise level measurement techniques shall employ all practical means of reducing the effect of wind generated noise at the microphone. Ambient noise level measurements may be performed when wind velocities at the proposed project Site are sufficient to allow Wind Turbine operation, provided that the wind velocity does not exceed thirty (30) mph at the ambient noise measurement location.

D. Any noise level falling between two whole decibels shall be the lower of the two.

E. Each WECS shall be setback from Site boundaries, measured from the center of the WECS, a minimum distance of:

1. 500 feet from the nearest Site boundary property line, except the setback shall be 500 feet where the boundary is with state, county, town, or village-owned property.

2. 500 feet from the nearest public road.

3. 1,000 feet from the nearest off-Site residence existing at the time of application, measured from the exterior of such residence.

4. 100 feet from state-identified wetlands. This distance may be adjusted to be greater or lesser at the discretion of the reviewing body, based on topography, land cover, land uses, and other factors that influence the flight patterns of resident birds.

5. 500 feet from gas wells, unless waived in writing by the property owner.

F. Other Wind Energy Facility structures and improvements shall comply with the underlying zoning district regulations.

§ 690.13. Noise and Setback Easements; Variances

A. In the event the noise levels resulting from a WECS exceed the criteria established in this Article, or a setback requirement is not met, a waiver be granted from such requirement by the Town Board in the following circumstances:

1. Written consent from the affected property owners has been obtained stating that they are aware of the WECS and the noise and/or setback limitations imposed by this Article, and that they wish to be part of the Site as defined herein, and that consent is granted to (1) allow noise levels to exceed the maximum limits otherwise allowed or (2) allow setbacks less than required; and

2. In order to advise all subsequent owners of the burdened property, the consent, in the form required for an easement, shall be recorded in the County Clerk's Office describing the benefited and burdened properties. Such easements shall be permanent and may not be revoked without the consent of the Town Board, which consent shall be granted upon either the completion of the decommissioning of the benefited WECS in accordance with this Article, or the acquisition of the burdened parcel by the owner of the benefited parcel or the WECS.

3. In any case where written consent is not obtained, a variance from the Zoning Board of Appeals shall be required.

§ 690.14. Creation of Wind Overlay Districts and Issuance of Special Use Permits.

A. Upon completion of the review process, the Town Board shall, upon consideration of the standards in this Article and the record of the SEQRA review, issue a written decision setting forth the reasons for approval, conditions of approval, or disapproval.

B. If approved, the Town Board will direct the Town Clerk to modify the Official Map to reflect the creation of the Wind Overlay Districts, and authorize Town staff to issue a Special Use Permit for each WECSs upon satisfaction of all conditions for said Permit, and direct the building inspector to issue a building permit, upon compliance with the Uniform Fire Prevention and Building Code and the other conditions of this Article.

C. The decision of the Town Board shall be filed within five days in the office of the Town Clerk and a copy mailed to the applicant by first class mail.

D. If any approved WECS is not substantially commenced within two years of issuance of the permit, the special use permit shall expire.

§ 690.15 Abatement.

A. If any WECS remains non-functional or inoperative for a continuous period of 1 year, the applicant agrees that, without any further action by the Town Board, it shall remove said system at its own expense. Removal of the system shall include at least the entire above ground structure, including transmission equipment and fencing, from the property. This provision shall not apply if the applicant demonstrates to the Town that it has been making good faith efforts to restore the WECS to an operable condition, but nothing in this provision shall limit the Town's ability to order a remedial action plan after public hearing.

B. Non-function or lack of operation may be proven by reports to the Public Service Commission, NYSERDA, or by lack of income generation. The applicant shall make available (subject to a non-disclosure agreement) to the Town Board all reports to and from the purchaser of energy from individual Wind Energy Conversion Systems, if requested necessary to prove the WECS is functioning, which reports may be redacted as necessary to protect proprietary information.

C. Decommissioning Bond or Fund. The applicant, or successors, shall continuously maintain a fund or bond payable to the Town for the removal of non-functional towers and appurtenant facilities in an amount to be determined by the Town for the period of the life of the facility. This fund may consist of a letter of credit from a State of New York-licensed financial institution. All costs of the financial security shall be borne by the applicant.

§ 690.16. Limitations on Approvals; Easements on Town Property.

A. Nothing in this Article shall be deemed to give any applicant the right to cut down surrounding trees and vegetation on any property to reduce turbulence and increase wind flow to the Wind Energy Facility. Nothing in this Article shall be deemed a guarantee against any future construction or Town approvals of future construction that may in any way impact the wind flow to any Wind Energy Facility. It shall be the sole responsibility of the Facility operator or owner to acquire any necessary wind flow or turbulence easements, or rights to remove vegetation.

B. Pursuant to the powers granted to the Town to manage its own property, the Town may enter into noise, setback, or wind flow easements on such terms as the Town Board deems appropriate, as long as said agreements are not otherwise prohibited by state law or this Article.

§ 690.17. Permit Revocation.

A. Testing fund. A Special Use Permit shall contain a requirement that the applicant fund periodic noise testing by a qualified independent third-party acoustical measurement consultant, which may be required as often as every two years, or more frequently upon request of the Town Board in response to complaints by neighbors. The scope of the noise testing shall be to demonstrate compliance with the terms and conditions of the Special Use Permit and this Article and shall also include an evaluation of any complaints received by the Town. The applicant shall have 90 days after written notice from the Town Board, to cure any deficiency. An extension of the 90 day period may be considered by the Town Board, but the total period may not exceed 180 days.

B. Operation. A WECS shall be maintained in operational condition at all times, subject to reasonable maintenance and repair outages. Operational condition includes meeting all noise requirements and other permit conditions. Should a WECS become inoperable, or should any part of the WECS be damaged, or should a WECS violate a permit condition, the owner or operator shall remedy the situation within 90 days after written notice from the Town Board. The applicant shall have 90 days after written notice from the Town Board, to cure any deficiency. An extension of the 90 day period may be considered by the Town Board, but the total period may not exceed 180 days.

C. Notwithstanding any other abatement provision under this Article, and consistent with § 690.15(A) and §690.17(B), if the WECS is not repaired or made operational or brought into permit compliance after said notice, the Town may, after a public meeting at which the operator or owner shall be given opportunity to be heard and present evidence, including a plan to come into compliance, (1) order either remedial action within a particular timeframe, or (2) order revocation of the Special Use Permit for the WECS and require the removal of the WECS within 90 days. If the WECS is not removed, the Town Board shall have the right to use the security posted as part of the Decommission Plan to remove the WECS.

Wind Measurement Towers

§ 690.20. Wind Site Assessment.

The Town Board acknowledges that prior to construction of a WECS, a wind Site assessment is conducted to determine the wind speeds and the feasibility of using particular Sites. Installation of Wind Measurement Towers, also known as anemometer ("Met") towers, shall be permitted as Special Use in the Agricultural-Residential (AR1) Use District and the Transitional Use District.

§ 690.21. Applications for Wind Measurement Towers.

A. An application for a Wind Measurement Tower shall include

1. Name, address, and telephone number of the applicant. If the applicant is represented by an agent, the application shall include the name, address, and telephone number of the agent as well as an original signature of the applicant authorizing the representation.

2. Name, address, and telephone number of the property owner. If the property owner is not the applicant, the application shall include a letter or other written permission signed by the property owner (i) confirming that the property owner is familiar with the proposed applications and (ii) authorizing the submission of the application.

3. Address of each proposed tower Site, including Tax Map section, block, and lot number.

4. Site plan

5. Decommissioning Plan, based on the criteria in this Article for WECS, including a security bond or cash for removal.

§ 690.22. Standards for Wind Measurement Towers.

A. The distance between a Wind Measurement Tower and the property line shall be at least the Total Height of the tower. Sites can include more than one piece of property and the requirement shall apply to the combined properties. Exceptions for neighboring property are also allowed with the consent of those property owners.

B. Special Use permits for Wind Measurement Towers may be issued by the Town Board for a period of up to two years. Permits may be renewed if the Facility is in compliance with the conditions of the Special Use Permit.

Small Wind Energy Conversion Systems

§ 690.30. Purpose and Intent.

The purpose of this Article is to provide standards for small wind energy conversion systems designed for on-site home, farm, and small commercial use, and that are primarily used to reduce on-site consumption of utility power. The intent of this Article is to encourage the development of small wind energy systems and to protect the public health, safety, and community welfare.

§ 690.31. Permitted Areas.

Small Wind energy systems may be permitted in any zoning district upon issuance of a Special Use Permit.

§ 690.32. Applications.

A. Applications for Small WECS special use permits shall include:

1. Name, address, and telephone number of the applicant. If the applicant will be represented by an agent, the name, address, and telephone number of the agent as well as an original signature of the applicant authorizing the agent to represent the applicant.

2. Name and address of the property owner. If the property owner is not the applicant, the application shall include a letter or other written permission signed by the property owner (i) confirming that the property owner is familiar with the proposed applications and (ii) authorizing the submission of the application.

3. Address of each proposed tower Site, including Tax Map section, block, and lot number.

4. Evidence that the proposed tower height does not exceed the height recommended by the manufacturer or distributor of the system.

5. A line drawing of the electrical components of the system in sufficient detail to allow for a determination that the manner of installation conforms to the Electric Code**.**

6. Sufficient information demonstrating that the system will be used primarily to reduce on-site consumption of electricity.

7. Written evidence that the electric utility service provider that serves the proposed Site has been informed of the applicant's intent to install an interconnected customer-owned electricity generator, unless the applicant does not plan, and so states in the application, to connect the system to the electricity grid.

8. A visual analysis of the Small WECS as installed, which may include a computerized photographic simulation, demonstrating the visual impacts from nearby strategic vantage points. The visual analysis shall also indicate the color treatment of the system's components and any visual screening incorporated into the project that is intended to lessen the system's visual prominence.

§ 690.33. Development Standards.

All small wind energy systems shall comply with the following standards. Additionally, such systems shall also comply with all the requirements established by other sections of this Article that are not in conflict with the requirements contained in this section.

1. A system shall be located on a lot a minimum of one acre in size, however, this requirement can be met by multiple owners submitting a joint application.

2. Only one small wind energy system tower per legal lot shall be allowed, unless there are multiple applicants, in which their joint lots shall be treated as one lot for purposes of this Article.

3. Small Wind energy systems may be used primarily to reduce the on-Site consumption of electricity.

4. Tower heights may be allowed as follows:

(a) 65 feet or less on parcels between one and five acres.
(b) 120 feet or less on parcels of five or more acres.
(c) The allowed height shall be reduced if necessary to comply with all applicable Federal Aviation Requirements, including Subpart B (commencing with Section

77.11) of Part 77 of Title 14 of the Code of Federal Regulations regarding installations close to airports.

5. The maximum turbine power output is limited to 100 kW.

6. The system's tower and blades shall be painted a non-reflective, unobtrusive color that blends the system and its components into the surrounding landscape to the greatest extent possible and incorporate non-reflective surfaces to minimize any visual disruption.

7. The system shall be designed and located in such a manner to minimize adverse visual impacts from public viewing areas (e.g., public parks, roads, trails). To the greatest extent feasible a small wind energy system:

(a) Shall not project above the top of ridgelines.

(b) If visible from public viewing areas, shall use natural landforms and existing vegetation for screening.

(c) Shall be screened to the maximum extent feasible by natural vegetation or other means to minimize potentially significant adverse visual impacts on neighboring residential areas.

8. Exterior lighting on any structure associated with the system shall not be allowed except that which is specifically required by the Federal Aviation Administration.

9. All on-site electrical wires associated with the system shall be installed underground except for "tie- ins" to a public utility company and public utility company transmission poles, towers and lines. This standard may be modified by the decision-maker if the project terrain is determined to be unsuitable due to reasons of excessive grading, biological impacts, or similar factors.

10. The system shall be operated such that no disruptive electromagnetic interference is caused. If it has been demonstrated that a system is causing harmful interference, the system operator shall promptly mitigate the harmful interference or cease operation of the system.

11. At least one sign shall be posted on the tower at a height of five feet warning of electrical shock or high voltage and harm from revolving machinery. No brand names, logo, or advertising shall be placed or painted on the tower, rotor, generator, or tail vane where it would be visible from the ground, except that a system or tower's manufacturer's logo may be displayed on a system generator housing in an unobtrusive manner

12. Towers shall be constructed to provide one of the following means of access control, or other appropriate method of access:

(a) Tower-climbing apparatus located no closer than 12 feet from the ground.

(b) A locked anti-climb device installed on the tower.

(c) A locked, protective fence at least six feet in height that encloses the tower.

13. Anchor points for any guy wires for a system tower shall be located within the property that the system is located on and not on or across any above-ground electric transmission or distribution lines. The point of attachment for the guy wires shall be enclosed by a fence six feet high or sheathed in bright orange or yellow covering from three to eight feet above the ground.

14. Construction of on-site access roadways shall be minimized. Temporary access roads utilized for initial installation shall be re-graded and re-vegetated to the pre-existing natural condition after completion of installation.

15. To prevent harmful wind turbulence from existing structures, the minimum height of the lowest part of any horizontal axis wind turbine blade shall be at least 30 feet above the highest structure or tree within a 250 foot radius. Modification of this standard may be made when the applicant demonstrates that a lower height will not jeopardize the safety of the wind turbine structure.

16. All small wind energy system tower structures shall be designed and constructed to be in compliance with pertinent provisions of the Uniform Building Code and National Electric Code.

17. All small wind energy systems shall be equipped with manual and automatic over-speed controls. The conformance of rotor and over-speed control design and fabrication with good engineering practices shall be certified by the manufacturer.

§ 690.34. Standards.

A Small Wind Energy System shall comply with the following standards:

1. Setback requirements. A Small WECS shall not be located closer to a property line than one and a half times the Total Height of the facility.

2. Noise. Except during short-term events including utility outages and severe wind storms, a Small WECS shall be designed, installed, and operated so that noise generated by the system shall not exceed the 50 decibels (dBA), as measured at the closest neighboring inhabited dwelling.

§ 690.35. Abandonment of Use.

A. Small WECS which is not used for twelve (12) successive months shall be deemed abandoned and shall be dismantled and removed from the property at the expense of the property owner. Failure to abide by and faithfully comply with this section or with any and all conditions that may be attached to the granting of any building permit shall constitute grounds for the revocation of the permit by the Town.

B. All Small WECS shall be maintained in good condition and in accordance with all requirements of this section.

Miscellaneous

§ 690.40. Fees.

A. There shall be non-refundable Application fees as follows:

1. Wind Overlay Zone rezoning: $500 per zone.

2. WECS Special Use Permit: $50 per megawatt of rated maximum capacity.

3. Wind Measurement Towers: $20 per vertical foot per tower.

4. Wind Measurement Tower Special Use Permit renewals: $200 per Wind Measurement Tower.

5. The cost of all legal notices and mailings shall be assessed to the applicant.

B. Building Permits.

1. The Town believes the review of building and electrical permits for Wind Energy Facilities requires specific expertise for those facilities. Accordingly, the permit fees for such facilities shall be increased by administrative costs which shall be $100 per permit request, plus the amount charged to the Town by the outside consultant hired by the Town to review the plans and inspect the work. In the alternative, the Town and the applicant may enter into an agreement for an inspection and/or certification procedure for these unique facilities. In such case, the Town and the applicant will agree to a fee arrangement and escrow agreement to pay for the costs of the review of the plans or certifications, or to conduct inspections as agreed by the parties.

2. The applicant shall, prior to the receipt of a building permit, demonstrate that the proposed facility meets the system reliability requirements of the New York Independent System Operator, or provide proof that it has executed an Interconnection Agreement with the New York Independent System Operator and/or the applicable Transmission Owner.

C. Nothing in this Article shall be read as limiting the ability of the Town to enter into Host Community agreements with any applicant to compensate the Town for expenses or impacts on the community. The Town shall require any applicant to enter into an escrow agreement to pay the engineering and legal costs of any application review, including the review required by SEQRA.

D. The Town Board may amend these fees, by resolution after a properly noticed public hearing.

§ 690.41. Tax Exemption.

The Town hereby exercises its right to opt out of the Tax Exemption provisions of Real Property Tax Law §487, pursuant to the authority granted by paragraph 8 of that law.

§ 690.42. Enforcement; Penalties and remedies for violations.

A. In addition to the Code Enforcement Officer under §701, the Town Board may appoint such Town staff or outside consultants as it sees fit to enforce this Article.

B. Any person owning, controlling, or managing any building, structure, or land who shall undertake a wind energy conversion facility or wind monitoring tower in violation of this Article or in noncompliance with the terms and conditions of any permit issued pursuant to this Article, or any order of the enforcement officer, and any person who shall assist in so doing, shall be guilty of an offense and subject to a fine of not more than $350 or to imprisonment for a period of not more than fifteen days, or subject to both such fine and imprisonment for a first offense, for a Second offense (both within a period of five years), a fine not less than $350 nor more than $700, or imprisonment not to exceed six months, or both, and for a Third or more offense (all of which occurred within five years), a fine not less than $700 nor more than $1,000, or imprisonment not to exceed six months, or both. Every such person shall be deemed guilty of a separate offense for each week such violation shall continue. The Town may institute a civil proceeding to collect civil penalties in the amounts set forth herein for each violation and each week said violation continues shall be deemed a separate violation.

C. In case of any violation or threatened violation of any of the provisions of this Article, including the terms and conditions imposed by any permit issued pursuant to this Article, in addition to other remedies and penalties herein provided, the Town may institute any appropriate action or proceeding to prevent such unlawful erection, structural alteration, reconstruction, moving, and/or use, and to restrain, correct, or abate such violation, to prevent the illegal act.

Section 8: **Severability**

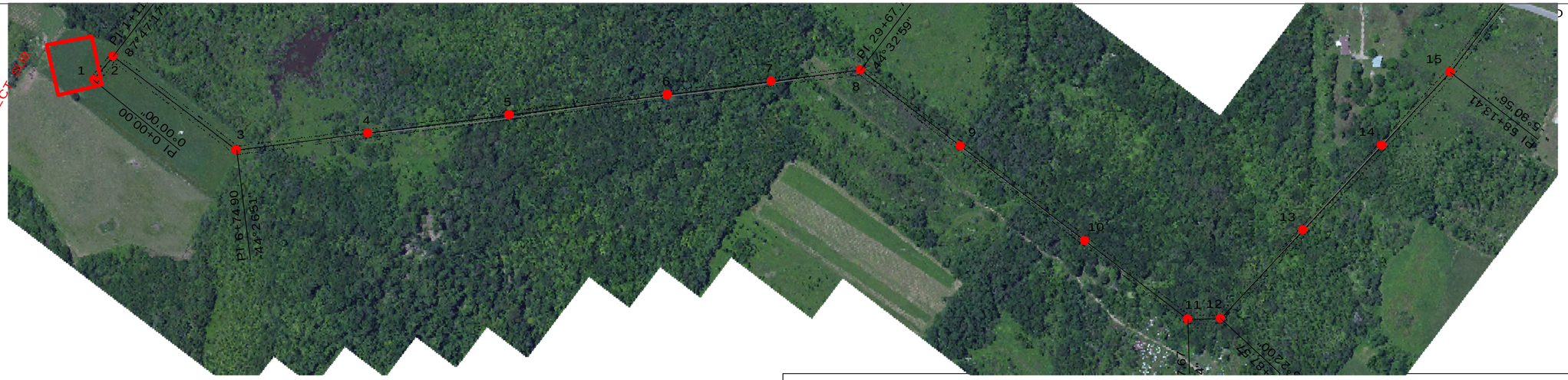
Should any provision of this Local Law be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of this Local Law as a whole or any part thereof other than the part so decided to be unconstitutional or invalid.

Section 9: Effective Date

This Local Law shall be effective upon its filing with the Secretary of State in accordance with the Municipal Home Rule Law.

048069/00000 BFLODOCS 1940100v1

Appendix B: Ball Hill Wind Energy 115kv Transmission Line Plan and Profile Drawings



200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE

1 STA=0+00.40 HT=61.00 ELE=1453.11 EMBED LEN=11.00
STA=0+11.40 HT=70.00 ELE=1450.16 EMBED LEN=10.00
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5 STA=16+78.03 HT=65.50 ELE=1433.86 EMBED LEN=9.50
6 STA=22+59.79 HT=65.50 ELE=1446.00 EMBED LEN=9.50
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8 STA=29+67.74 HT=65.50 ELE=1426.02 EMBED LEN=9.50
9 STA=34+26.47 HT=65.50 ELE=1423.74 EMBED LEN=9.50
10 STA=39+95.26 HT=65.50 ELE=1404.00 EMBED LEN=9.50
11 STA=44+67.67 HT=56.50 ELE=1392.00 EMBED LEN=8.50
STA=45+87.57 HT=56.50 ELE=1385.86 EMBED LEN=8.50
13 STA=50+25.28 HT=65.50 ELE=1376.80 EMBED LEN=9.50

110.75 GUYED STRUCTURE 563.74 483.99 GUYED STRUCTURE 519.14 581.76 379.81 328.14 GUYED STRUCTURE 458.74 568.79 472.41 119.84 GUYED STRUCTURE GUYED STRUCTURE 437.71

PI 0°00'00" PI 87°47'17" PI -44°26'51" PI 44°32'59" 57'44" 200"

1800 1750 1700 1650 1600 1550 1500 1450 1400 1350

-2+50 0+00 2+50 5+00 7+50 10+00 12+50 15+00 17+50 20+00 22+50 25+00 27+50 30+00 32+50 35+00 37+50 40+00 42+50 45+00 47+50 50+00

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ISSU	DATE	DESCRIPTION	DRAWN	DES'D	CHK'D	APP'D
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PURPOSE: RES DESIGN
COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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RES AMERICA CONSTRUCTION INC.
11TH & 12TH FLOOR, 350 5TH AVENUE, NEW YORK, NY 10118
TELEPHONE (212) 971-1000 FAX (212) 971-1099

DRAWING NUMBER: 1 OF 7

BALL HILL - WIND ENERGY PROJECT

STA -2+50 TO STA 50+29
STR 1 TO STR 13

CHAUTAUQUA COUNTY, NEW YORK

NOTE BLOCK:

PLS-CADD DRAWING

200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE

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GUYED STRUCTURE | GUYED STRUCTURE | GUYED STRUCTURE | GUYED STRUCTURE | GUYED STRUCTURE

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1700 1650 1600 1550 1500 1450 1400 1350 1300 1250

47+50 | 50+00 | 52+50 | 55+00 | 57+50 | 60+00 | 62+50 | 65+00 | 67+50 | 70+00 | 72+50 | 75+00 | 77+50 | 80+00 | 82+50 | 85+00 | 87+50

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PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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RES AMERICA CONSTRUCTION, INC.
11 HIGH STREET, 3RD FLOOR
BERLIN, CT 06037
TELEPHONE (203) 678-2900 FAX (203) 678-2999

DRAWN BY:

BALL HILL - WIND ENERGY PROJECT

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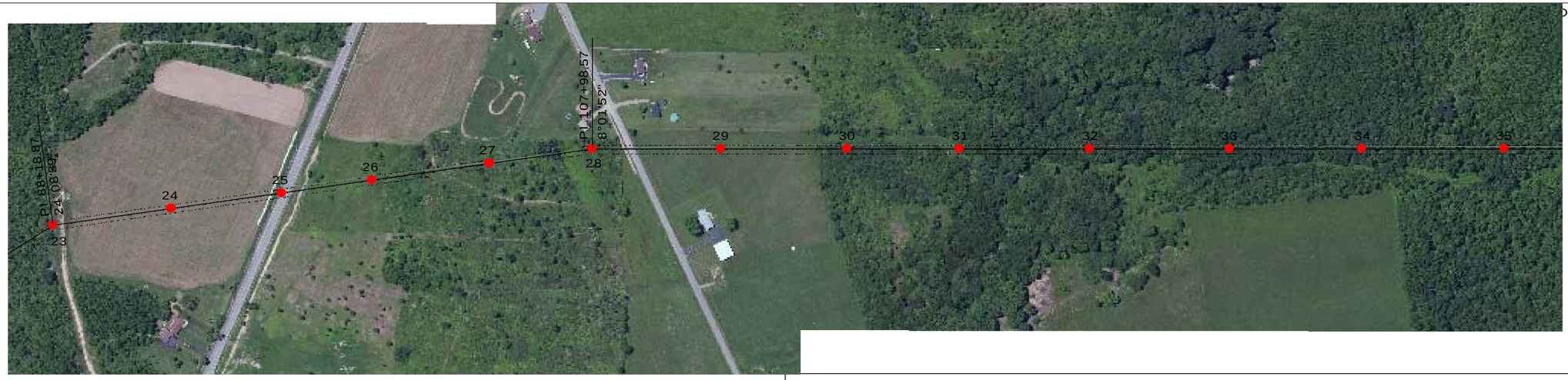
STR 13 TO STR 23

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

2 OF 7



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40.0 FT. VERT. SCALE

NORTH

NOTES
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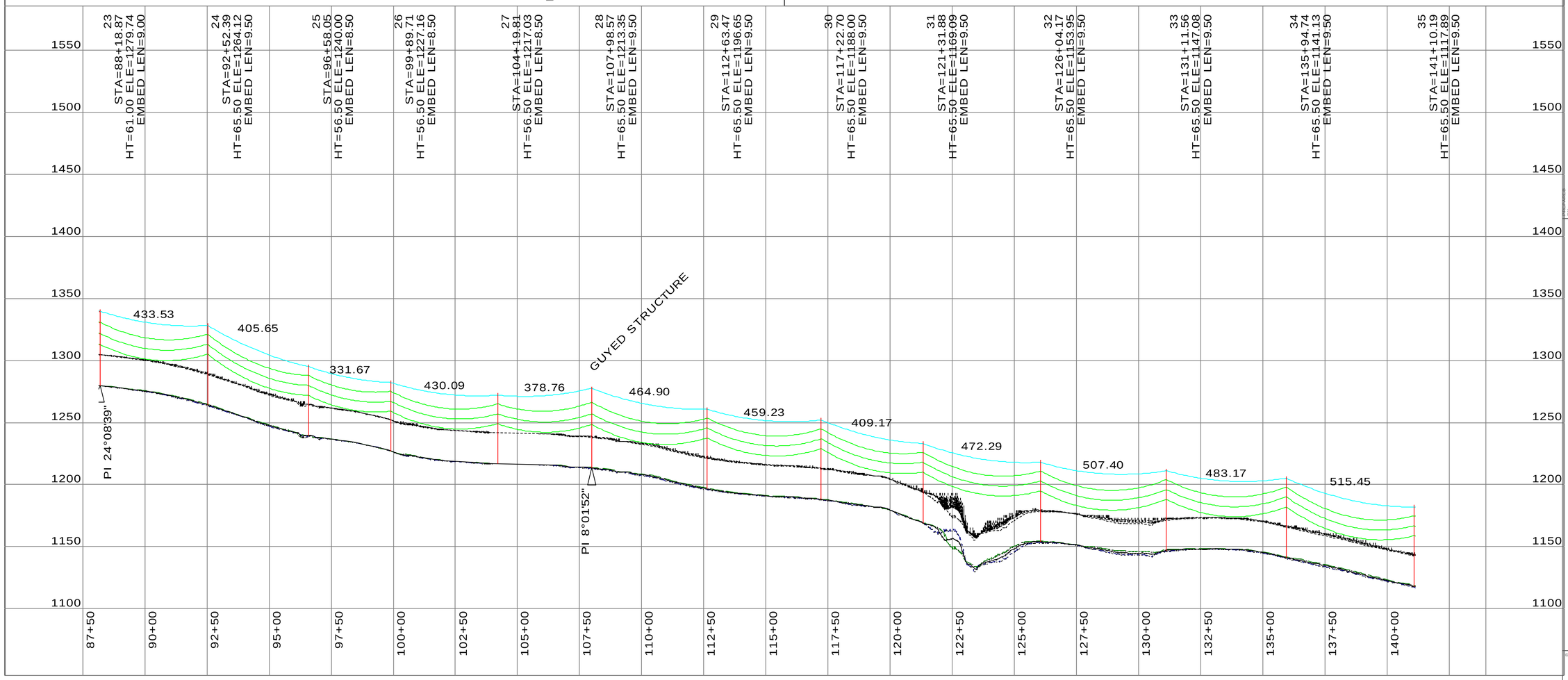

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PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

PROJECT NO: 8041

WTG LAYOUT: WTGXXXXXX

RES AMERICA CONSTRUCTION INC.
11111 W 95TH AVE. SUITE 440 BERRUPEDIA, CO
TELEPHONE (303) 420-4800 FAX (303)

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BALL HILL - WIND ENERGY PROJECT

STA 87+50 TO STA 141+13
STR 23 TO STR 35

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

3 OF 7

NOTE BLOCK:

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40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
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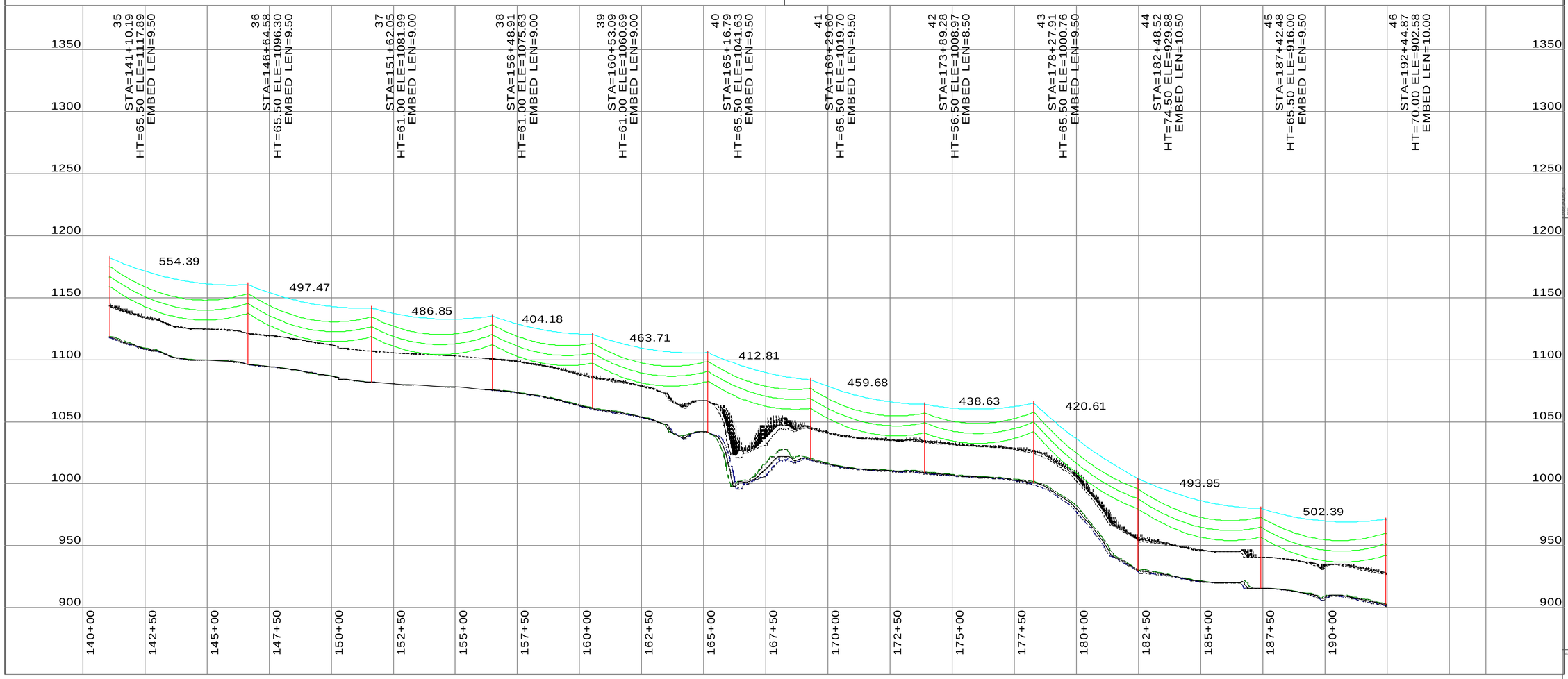

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ISSUE	DATE	DESCRIPTION	DRAWN	DESIGN	CHK	APPR
A	8041	RES 10% DESIGN	JTL	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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PROJECT NO.

WTG LAYOUT: NGAXXXXXX

RES AMERICA CONSTRUCTION, INC.
11101 W 120TH AVE., SUITE 400 BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

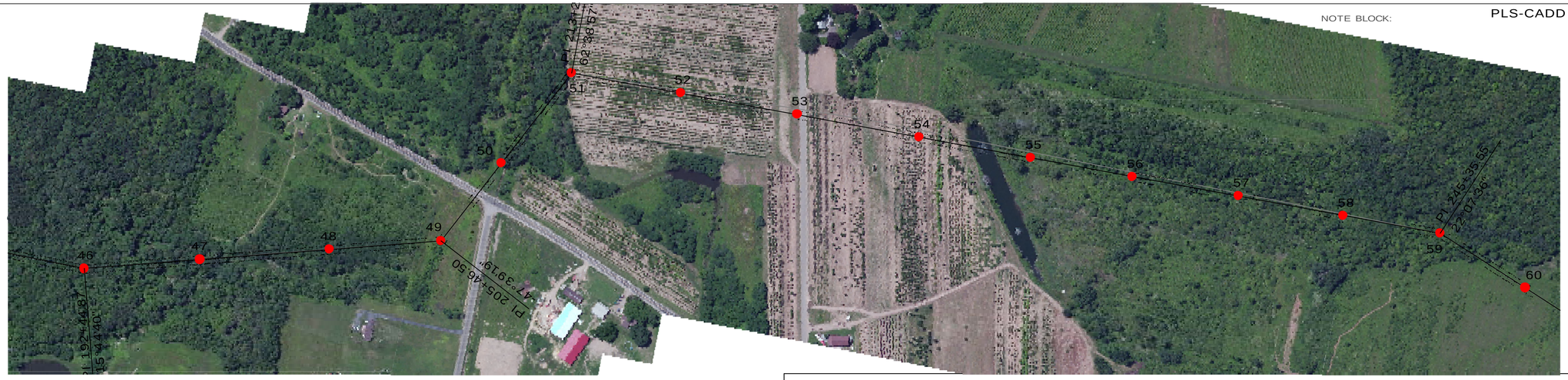
BALL HILL - WIND ENERGY PROJECT

STA 140+00 TO STA 192+48
STR 35 TO STR 46

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

4 OF 7



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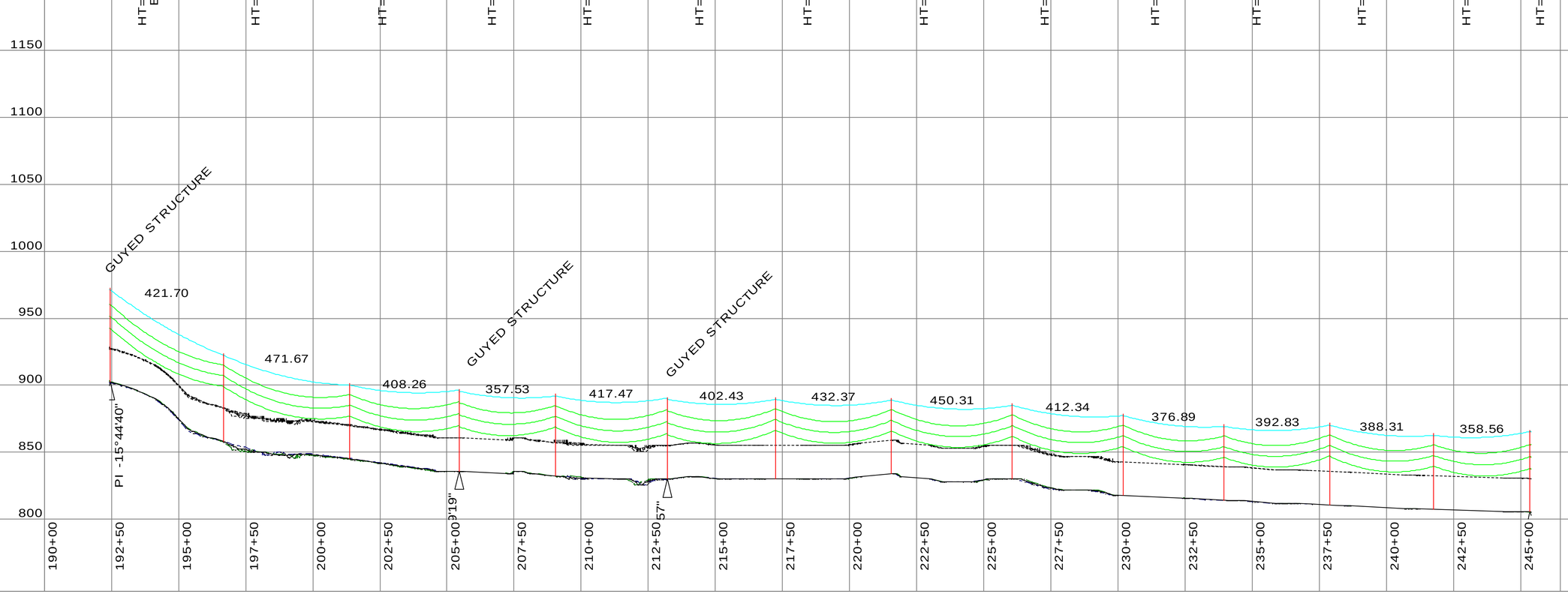

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ISSU	DATE	DESCRIPTION	DRAWN	DESIGN	CHK	APP'D
A	8041	RES 10% DESIGN	JTL	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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FIELD DEVIATIONS FROM THIS DESIGN MUST BE APPROVED BY A TEP (TECHNICAL ENQUIRY PROCESS) PRIOR TO THE FORMATION OF THE ENGINEER.

PROJECT NO:

WTG LAYOUT NO: XXXXXXX

RES AMERICA CONSTRUCTION INC.
11101 W 120TH AVE, BROOMFIELD, CO
TELEPHONE (303) 439-6000 FAX (303)

BALL HILL - WIND ENERGY PROJECT

STA 190+00 TO STA 245+39
STR 46 TO STR 59

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

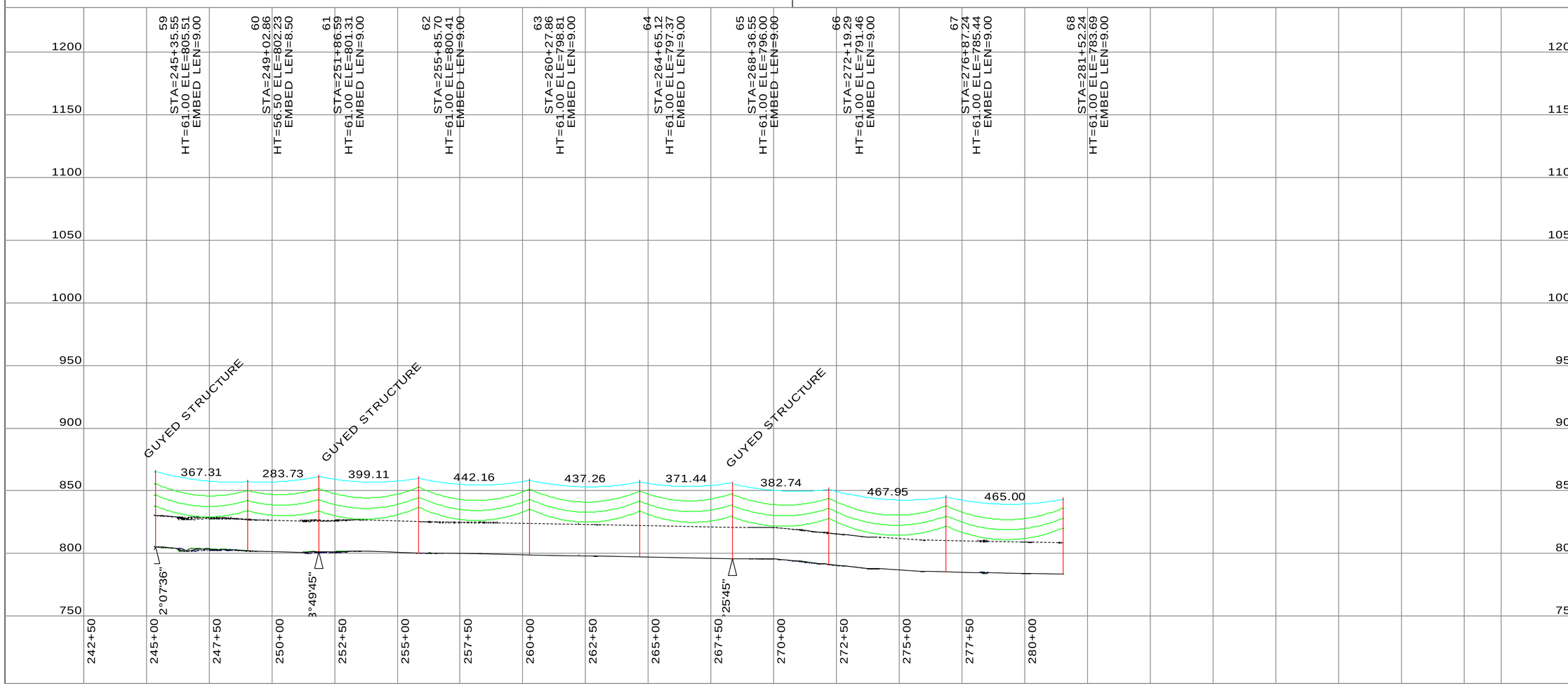
5 OF 7

200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE



INFORMATION SHOWN IS SUBJECT TO CHANGE. NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION	DRAWN	DESIGN	CHK	APPR
A	8041	RES 10% DESIGN	JTL	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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PROJECT NO.

WTG LAYOUT NO. XXXXXX

RES AMERICA CONSTRUCTION, INC.
11101 W 120TH AVE., SUITE 400, BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

BALL HILL - WIND ENERGY PROJECT

STA 242+50 TO STA 281+56
STR 59 TO STR 68

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

6 OF 7

NOTE BLOCK:

PLS-CADD DRAWING

200.0 FT. HORIZ. SCALE

40.0 FT. VERT. SCALE

NORTH

NOTES
1) SINGLE 795 ACSR "DRAKE" CONDUCTORS SHOWN AT 212° F
2) OPGW SHOWN AT 120° F
3) 115KV CLEARANCE LINE IS DISPLAYED 25` TO GROUND (NESC REQ. 20` + 5` BUFFER)
4) GUYS TYPICALLY EXTEND 100` BEYOND STRUCTURE

INFORMATION SHOWN IS SUBJECT TO CHANGE. NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION	DRAWN	DESIGN	CHK	APPR
A	80416	RES 10% DESIGN	JTL	JTL	JTL	CLC

PURPOSE: RES DESIGN

COORD SYSTEM: STATE PLANE NAD83 3103 NEW YORK WEST

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FIELD DEVIATIONS FROM THIS DESIGN ARE NOT PERMITTED WITHOUT DOCUMENTATION THROUGH A TEF (TECHNICAL ENQUIRY FORM) APPROVED BY THE ENGINEER.

PROJECT NO.

WTG LAYOUT: NGAXXXXXX

RES AMERICA CONSTRUCTION, INC.
11101 W 120TH AVE., SUITE 400 BROOMFIELD, CO 80021
TELEPHONE: (303) 439-4200, FAX: (303) 439-4299

BALL HILL - WIND ENERGY PROJECT

STA 280+00 TO STA 299+07
STR 68 TO STR 73

CHAUTAUQUA COUNTY, NEW YORK

DRAWING NUMBER:

7 OF 7